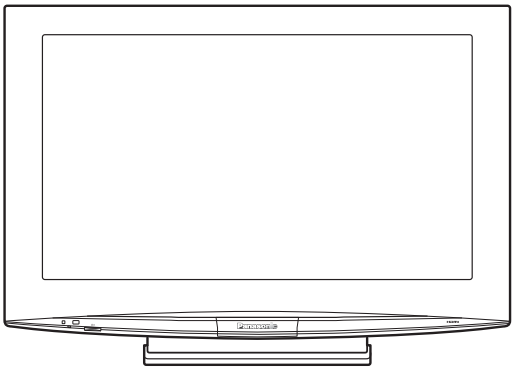
Order Number PTWTV0909003CE

Service Manual

High Definition Hospitality LCD Display



Model No. TH-37LRT12U/M/A
TH-32LRT12U-A

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

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1 Safety Precautions

1.1. General Guidelines

1. When conducting repairs and servicing, do not attempt to modify the equipment, its parts or its materials.
2. When wiring units (with cables, flexible cables or lead wires) are supplied as repair parts and only one wire or some of the wires have been broken or disconnected, do not attempt to repair or re-wire the units. Replace the entire wiring unit instead.
3. When conducting repairs and servicing, do not twist the Faston connectors but plug them straight in or unplug them straight out.
4. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
5. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
6. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.1.1. Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading above 4Mohm.
   When the exposed metal does not have a return path to the chassis, the reading must be∞.

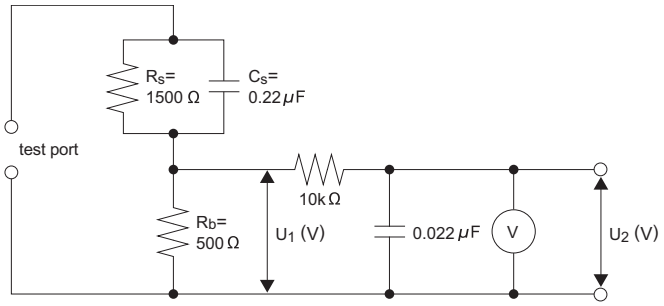


Figure 1. Leakage Current Test Tool

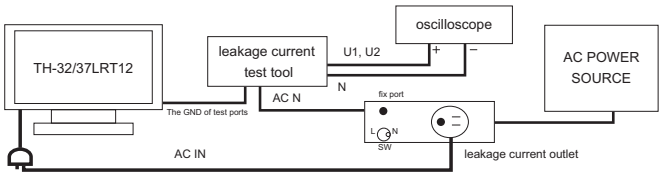


Figure 2.

1.1.2. Leakage Current Check (See Figure 1 and Figure 2)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Make a leakage current test loop as shown in Figure 1.
3. The method of connecting leakage current test loop is shown in Figure 2.
4. The measure value of U1(V) should be less than 35Vp and U2(V) should be less than 0.35Vp.

2 Warning

2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor “chip” components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static (ESD protected)” can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   Caution
   Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise ham less motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

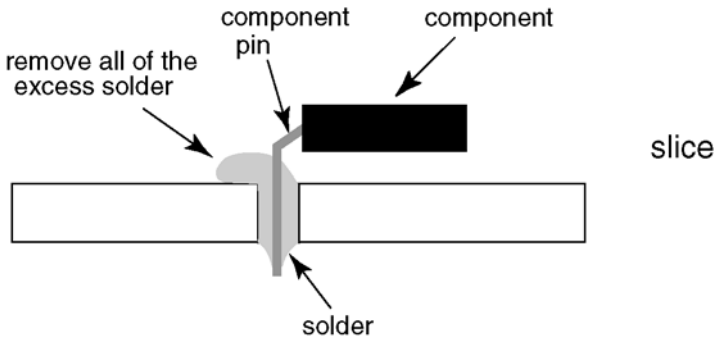
2.2. About lead free solder (PbF)

Note: Lead is listed as (Pb) in the periodic table of elements.
In the information below, Pb will refer to Lead solder, and PbF will refer to Lead Free Solder.
The Lead Free Solder used in our manufacturing process and discussed below is (Sn+Ag+Cu).
That is Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

This model uses Pb Free solder in it's manufacture due to environmental conservation issues. For service and repair work, we'd suggest the use of Pb free solder as well, although Pb solder may be used.
PCBs manufactured using lead free solder will have the PbF within a leaf Symbol **PbF** stamped on the back of PCB.

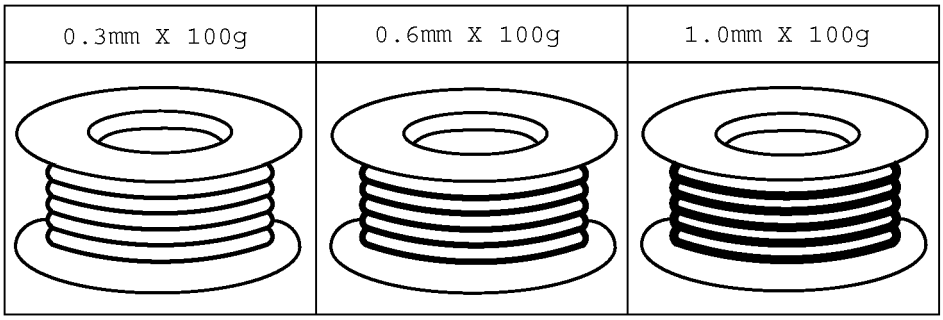
Caution

- Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30~40 °C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).
- Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C).
  If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.
- After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side. (see figure below)



Suggested Pb free solder

There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder can also be used.

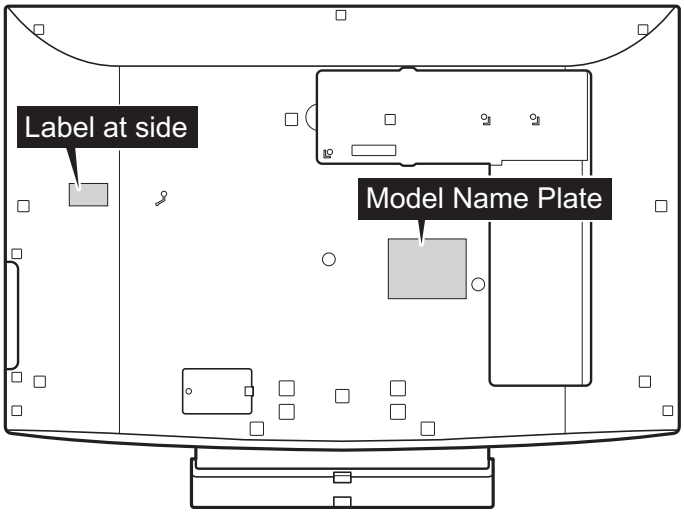


3 Service Navigation

3.1. Important Notice

3.1.1. MANUFACTURING ID NO.

This service manual is for the MANUFACTURING ID NO. indicated in the label at side and the model name plate of the unit.



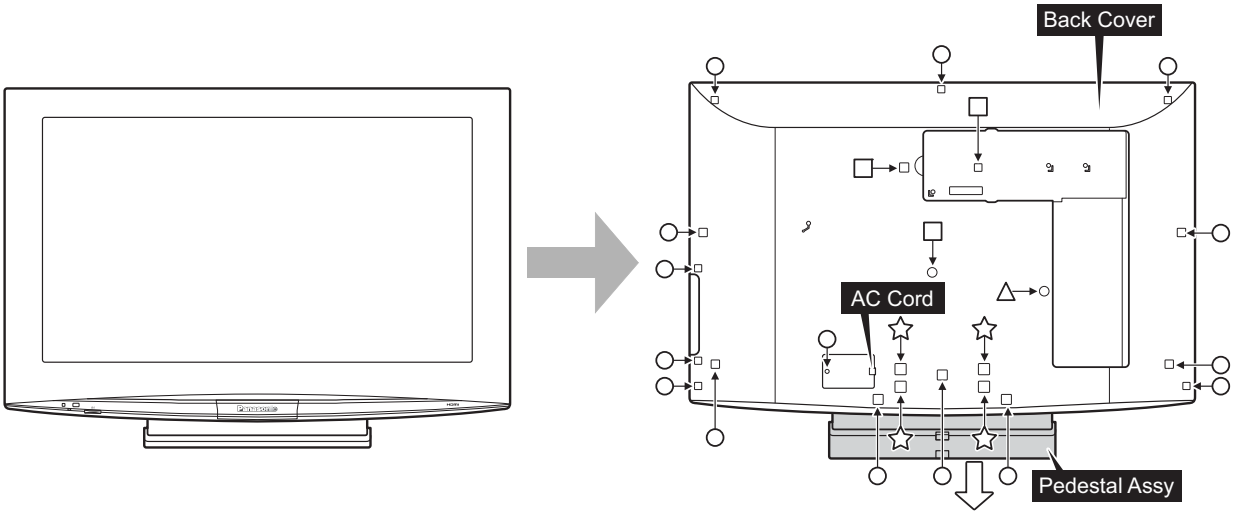
3.2. Different P.C.B.

Parts No.		Parts name & Description	Remarks
TH-32LRT12U	TH-32LRT12U-A		
TNM4CD0819FA	TNM4CD0819FC	MAIN BOARD	only change soft
TNM4CD0822F	TNM4CD0821F	POWER BOARD	
TNM4CD0906F		IR	
TNM4CD0809F		AV3	
TNM4CD0810F		KEY	
TNM4CD0820F		RS232	

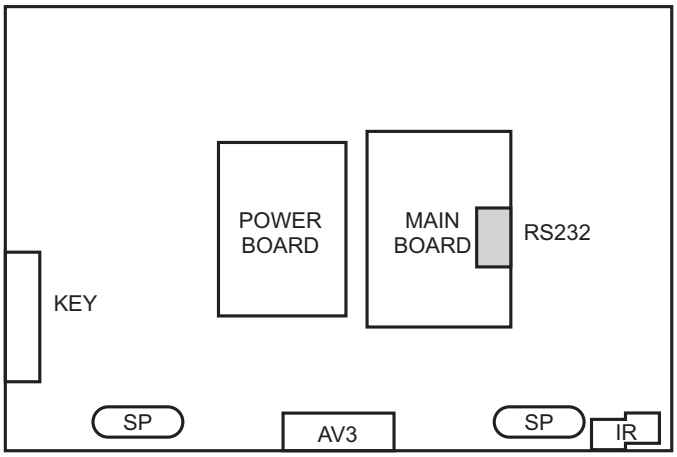
3.3. Service Hint

TH-32LRT12 U-A

Remove the Rear Cover



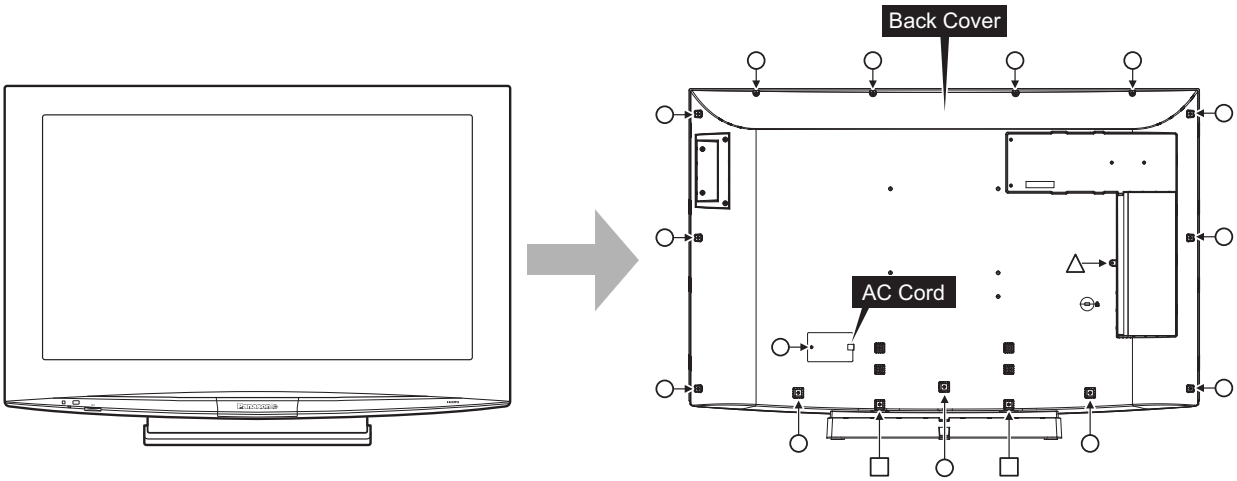
1. Remove: 15 screws (○) XTN4+15JFZ
   3 screws (□) XTB4+10FFZ
   1 screw (△) THT4CM010K
   4 screws (☆) XYN4+F11FZ
2. Remove Pedestal Assy
3. Remove AC Cord and Back Cover



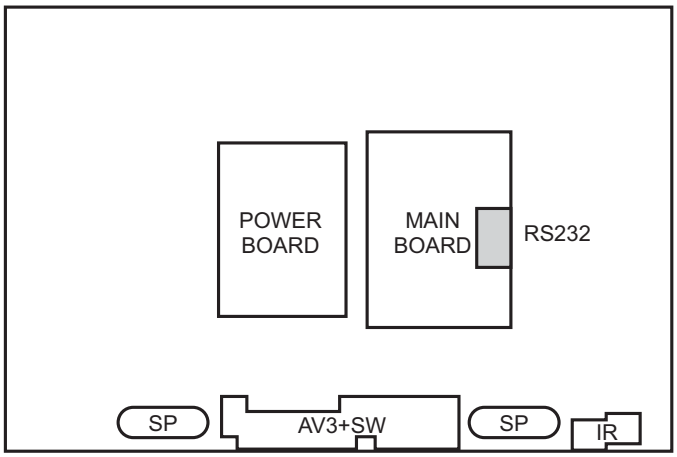
3.4. Service Hint

TH-37LRT12 U/M/A

Remove the Rear Cover



1. Remove: 14 screws (○) XTB4+15JFZ
   2 screws (□) XYN4+F10FZ
   1 screw (△) THT4CM010K
2. Remove AC Cord and Back Cover



Board Name	Function
MAIN BOARD	Sync Processor, Audio Processor, Speaker Out Amplifier, Slot Interface (Audio / Video / Sync Input Switch)
POWER BOARD	Power Supply Unit
IR	Remote Switch, LED-G, R, Power Switch
AV3+SW	AV3+KEY Switch
RS232	RS-232 Input terminal

3.5. Applicable signals

Applicable input signals for Mini D-sub 15P

	Signal name	Horizontal frequency (kHz)	Vertical frequency (Hz)	Dot clock frequency (MHz)
1	640 x 480 @ 60 Hz	31.47	59.94	25.18
2	640 x 480 @ 72 Hz	37.86	72.81	31.5
3	640 x 480 @ 75 Hz	37.50	75.00	31.5
4	800 x 600 @ 56 Hz	35.16	56.25	36.0
5	800 x 600 @ 60 Hz	37.88	60.32	40.0
6	800 x 600 @ 72 Hz	48.08	72.19	50.0
7	800 x 600 @ 75 Hz	46.88	75.00	49.5
8	1024 x 768 @ 60 Hz	48.36	60.00	65.0
9	1024 x 768 @ 70 Hz	56.48	70.07	75.0
10	1024 x 768 @ 75 Hz	60.02	75.03	78.75

Applicable input signals for HDMI and YPbPr

HDMI Mode

	Signal name
1	480i@60Hz
2	480p@60Hz
3	576i@50Hz
4	576p@50Hz
5	720p@50Hz
6	720p@60Hz
7	1080i@50Hz
8	1080i@60Hz
9	1080p@50Hz
10	1080p@60Hz

YPbPr Mode

	Signal name
1	480i@60Hz
2	480p@60Hz
3	576i@50Hz
4	576p@50Hz
5	720p@50Hz
6	720p@60Hz
7	1080i@50Hz
8	1080i@60Hz
9	1080p@50Hz
10	1080p@60Hz

Note: Signals without the above specifications may not be displayed properly.

4 Specifications

4.1. TH-32LRT12U-A

Power Source		110 - 127 V AC 50/60 Hz (TH-32LRT12U-A)
Power Consumption		
	Power on	155 W
	Stand-by condition	1.0 W (TH-32LRT12U-A)
Aspect Ratio		16:9
Screen size		27.5" (698 mm) (W) x 15.4" (392 mm) (H) x 31.5" (800 mm) (diagonal)
	(No.of pixels)	1,049,088 (1,366 (W) x 768 (H)) [4,098 x 768 dots]
Operating condition		
	Temperature	32 °F - 104 °F (0 °C - 40 °C)
	Humidity	20 % - 80 %
Connection terminals		
	PC IN	(MINI D-SUB 15PIN) G: 0.7 Vp-p (75 Ω) B: 0.7 Vp-p (75 Ω) R: 0.7 Vp-p (75 Ω) HD/VD: 1.0 - 5.0 Vp-p (high impedance) AUDIO IN (M3 JACK) 0.5 Vrms
	AV1-AV3	VIDEO IN (RCA PIN JACK x 3) 1.0 Vp-p (75 Ω) S VIDEO IN (MINI DIN 4PIN x 3) Y:1.0 Vp-p (75 Ω), C: 0.286 Vp-p (75 Ω) AUDIO IN (RCA PIN JACK x 3) 0.5 Vrms
	YP_BP_R	Y (RCA PIN JACK x 1) 1.0 Vp-p (75 Ω) P_B/P_R (RCA PIN JACK x 1) 0.7 Vp-p (75 Ω) AUDIO IN (RCA PIN JACK x 1) 0.5 Vrms
	HDMI1 - HDMI3	TYPE A Connector x 3
	AUDIO OUT	RCA PIN JACK x 2 0.5 Vrms
	SERIAL	EXTERNAL CONTROL TERMINAL (D-SUB 9PIN) RS-232C COMPATIBLE
Dimensions (W × H × D)		
	Including pedestal	32.4" (821 mm) x 23" (584 mm) x 9.3" (236 mm)
	Display Set only	32.4" (821 mm) x 21.3" (539 mm) x 4.2" (106 mm)
Mass (weight)		
	Including pedestal	approx. 36.4 lbs
	Display Set only	approx. 30.9 lbs
Sound		
	Audio Output	20W [10 W + 10 W] (10 % THD)

Note: Design and specifications are subject to change without notice. Mass and dimensions shown are approximate.

4.2. TH-37LRT12U/M/A

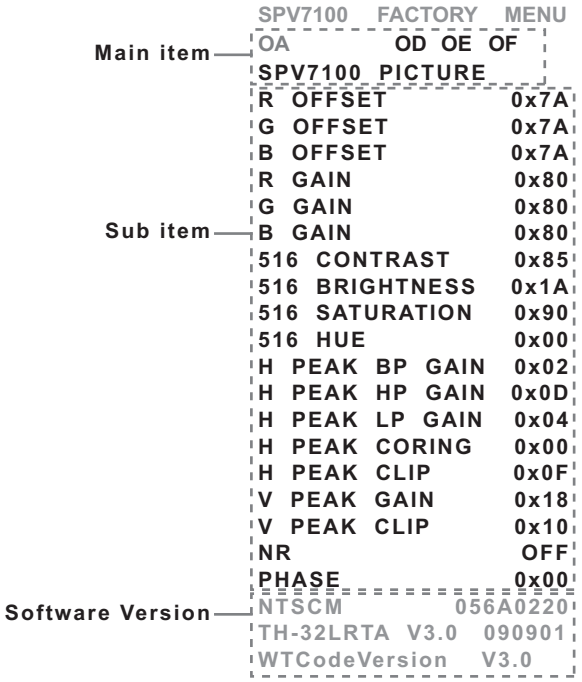
Power Source		110 - 127 V AC 50/60 Hz (TH-37LRT12U) 220 - 240 V AC, 50/60 Hz (TH-37LRT12A/M)
Power Consumption		
	Power on	190 W
	Stand-by condition	1.0 W (TH-37LRT12U) 1.5 W (TH-37LRT12A/M)
Aspect Ratio		16:9
Screen size		32.2" (819 mm) (W) x 18.1" (460 mm) (H) x 37.0" (940 mm) (diagonal)
	(No.of pixels)	1,049,088 (1,366 (W) x 768 (H)) [4,098 x 768 dots]
Operating condition		
	Temperature	32 °F - 104 °F (0 °C - 40 °C)
	Humidity	20 % - 80 %
Connection terminals		
	PC IN	(MINI D-SUB 15PIN) G: 0.7 Vp-p (75 Ω) B: 0.7 Vp-p (75 Ω) R: 0.7 Vp-p (75 Ω) HD/VD: 1.0 - 5.0 Vp-p (high impedance) AUDIO IN (M3 JACK) 0.5 Vrms
	AV1-AV3	VIDEO IN (RCA PIN JACK x 3) 1.0 Vp-p (75 Ω) S VIDEO IN (MINI DIN 4PIN x 3) Y:1.0 Vp-p (75 Ω), C: 0.286 Vp-p (75 Ω) AUDIO IN (RCA PIN JACK x 3) 0.5 Vrms
	YP_BP_R	Y (RCA PIN JACK x 1) 1.0 Vp-p (75 Ω) P_B/P_R (RCA PIN JACK x 1) 0.7 Vp-p (75 Ω) AUDIO IN (RCA PIN JACK x 1) 0.5 Vrms
	HDMI1 - HDMI3	TYPE A Connector x 3
	AUDIO OUT	RCA PIN JACK x 2 0.5 Vrms
	SERIAL	EXTERNAL CONTROL TERMINAL (D-SUB 9PIN) RS-232C COMPATIBLE
Dimensions (W × H × D)		
	Including pedestal	37.4" (949 mm) x 25.6" (650 mm) x 12.1" (307 mm)
	Display Set only	37.4" (949 mm) x 24" (608 mm) x 4.1" (104 mm)
Mass (weight)		
	Including pedestal	approx. 47.4 lbs
	Display Set only	approx. 39.7 lbs
Sound		
	Audio Output	20W [10 W + 10 W] (10 % THD)

Note: Design and specifications are subject to change without notice. Mass and dimensions shown are approximate.

5 Factory Mode

5.1. How to enter into Factory Mode

Press and hold [VOL+] button and [VOL-] button of the main unit more than 3 seconds.



5.1.1. Key command

[▲] button...Main items Selection in forward direction and value of sub items change.
[▼] button...Main items Selection in reverse direction and value of sub items change.
[▶] button...Sub items Selection in forward direction
[◀] button...Sub items Selection in reverse direction
[**OK**] button...Back to main items selection from sub items selection

5.1.2. Contents of adjustment mode

- Value is shown as a hexadecimal number.
- Preset value differs depending on mode
- After entering the adjustment mode, take note of the value in each item before starting adjustment.

Main item	Sub item	Adjustment
0A (SPV7100 PICTURE)	R OFFSET	Set R Brightness
	G OFFSET	Set G Brightness
	B OFFSET	Set B Brightness
	R GAIN	R white-Balance
	G GAIN	G white-Balance
	B GAIN	B white-Balance
	516 CONTRAST	Set_Decoder_Contrast
	516 BRIGHTNESS	Set_Decoder_Brightness
	516 SATURATION	Set_Decoder_Saturation
	516 HUE	Set_Decoder_Hue
	H PEAK BP GAIN	Static gain after BP for Peaking
	H PEAK HP GAIN	Static gain after HP for Peaking
	H PEAK LP GAIN	Static gain after LP for Peaking
	H PEAK CORING	Coring threshold for Peaking
	H PEAK CLIP	The adjusted threshold for Peaking
	V PEAK GAIN	Static gain for Vertical Edge Enhancement
	V PEAK CLIP	Adjusted threshold for Vertical Edge Enhancement
	NR	Noise reduction
	PHASE	PLL clock phase

Main item	Sub item	Adjustment
0B (SPV 7100 ADC)	ADC PR GAIN	R channel gain Register
	ADC Y GAIN	G channel gain Register
	ADC PB GAIN	B channel gain Register
	ADC PR OFFSET	R channel OFFSET Register
	ADC Y OFFSET	G channel OFFSET Register
	ADC PB OFFSET	B channel OFFSET Register
	ADC Auto White	AutoWhite
0D (SPV 7100 AUDIO)	100HZ EQ	MAIN Equalizer Band 1 Control (100 Hz)
	300HZ EQ	MAIN Equalizer Band 2 Control (300 Hz)
	1000HZ EQ	MAIN Equalizer Band 3 Control (1000 Hz)
	3000HZ EQ	MAIN Equalizer Band 4 Control (3000 Hz)
	8000HZ EQ	MAIN Equalizer Band 5 Control (8000 Hz)
	DEC LEV	LEV_ADJ_DEM_REG(level adjust)Stereo RF MODE
	MONO LEV	LEV_ADJ_DEM_REG(level adjust)MONO RF MODE
	NIC LEV	LEV_ADJ_DEM_REG(extra gain for NICAM) RF MODE
	SAP LEV	LEV_ADJ_DEM_REG(level adjust)SAP RF MODE
	ADC LEV	LEV_ADJ_DEM_REG(level adjust)AV Ypbpr PC MODE
	DIGIN LEV	LEV_ADJ_DEM_REG(level adjust)HDMI MODE
	LOUD	Set_Loudness_On_Off
	LOUD LEV	Set_LOUD_LEV
	LOUD FIL	Set_LOUD_LEV (500Hz or 1000Hz)filter
	SOUND AI	AVL Reference Level
	AUDIO OUT LEV	Set_AUDIO_OUT_LEV
0E (SPV 7100 SCALER)	H START	Set_H_Start_Position
	V START	Set_V_Start_Position
	H OVERSCAN	Set_H_Overscan
	V OVERSCAN	Set_V_Overscan
	OPTION	Set_H_V_Overscan_Reference_Point
0F (SPV 7100 SYSTEM)	POLLING STATE	Set_Polling_State
	EEPROM RESET	Reset_EEPROM
	BURN IN	BurnIn_Set
	UART ON DSUB	Set_UART_State
	OpenDebug	OpenDebugInformation
	Baud Rate	Set_BaudRate
	SPREAD SPECTRUM	Set_Spread_Spectrum
	DPLLMD-L	Display PLL modulation setting
	DPLLCU	Display PLL charge pump current setting
	BANK	Set_Bank
	REGISTER	Set_Register
	READ	Register_Read
	WRITE	Register_Write
	VALUE	Set_Register_Value

5.2. How to exit

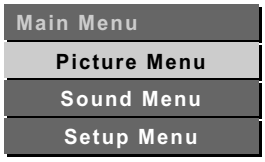
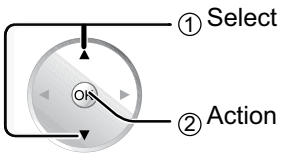
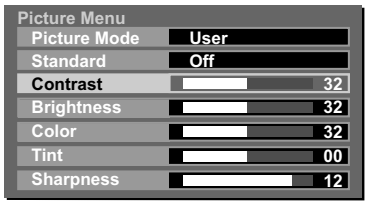
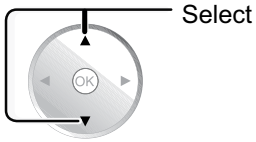
Switch off the power with the [POWER] button on the main unit or the [POWER] button on the remote control or press and hold [VOL+] and [VOL-] buttons on the main unit at the same time.

6 Operating Instructions

6.1. On-Screen Menu Display

On-Screen Menu Display

Various menus allow you to make settings for the picture, sound, and other functions so that you can enjoy watching Display best suited for you.

	Remote Control	Unit
1 Display the menu screen.	MENU — Press the menu button.	Press the MENU button. ① Press the CH buttons to select the menu. ② Press the MENU button.
2 Select the menu. 		
3 Select the item.  (Example: Picture Menu)		Press the CH < or > buttons to select the item.
4 Adjust or select. 		Press the VOL + or – buttons.
5 Exit the menu.	RETURN — Press to return to the previous menu. Press several times until you exit the menu.	Press the INPUT button several times until you exit the menu.

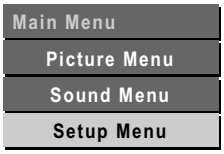
6.2. Hotel Mode

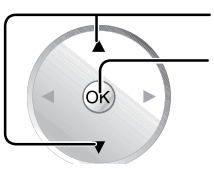
The Hotel Mode is a special function which allows users to configure settings to suit certain locations or applications.

6.2.1. Hotel mode setup

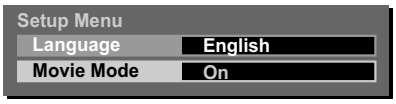
1 Press MENU to display the menu screen.

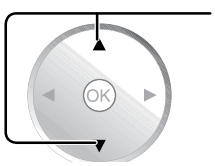
2 Select **Setup Menu**.





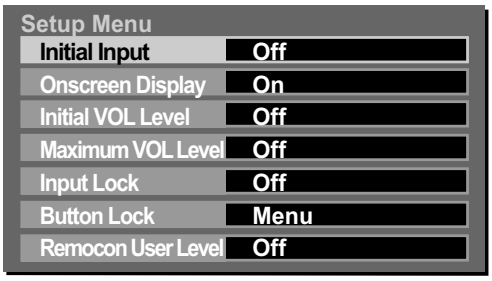
3 Select **Movie Mode**.

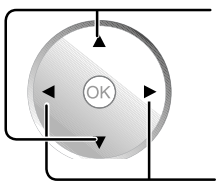




4 Press and hold MUTE for more than 3 seconds.

5 Select the item and set desired settings.





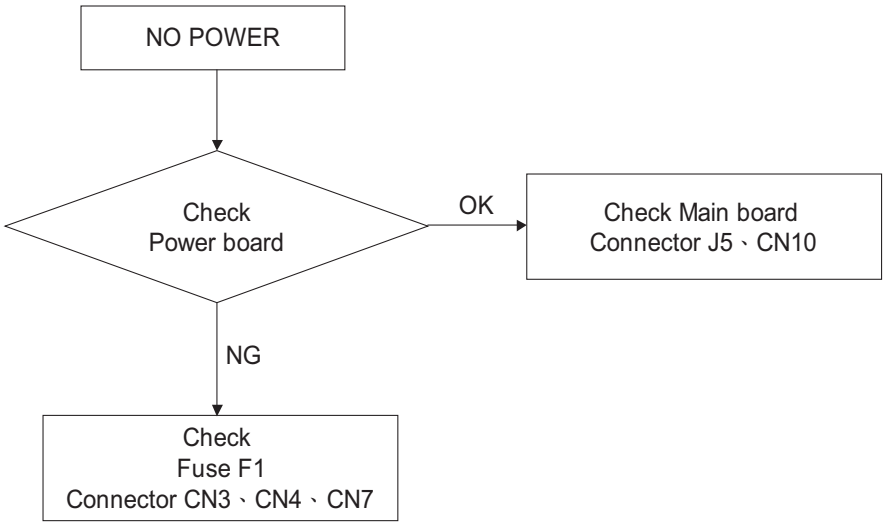
6 Press RETURN repeatedly to exit the menu.

6.2.2. Hotel mode menu list

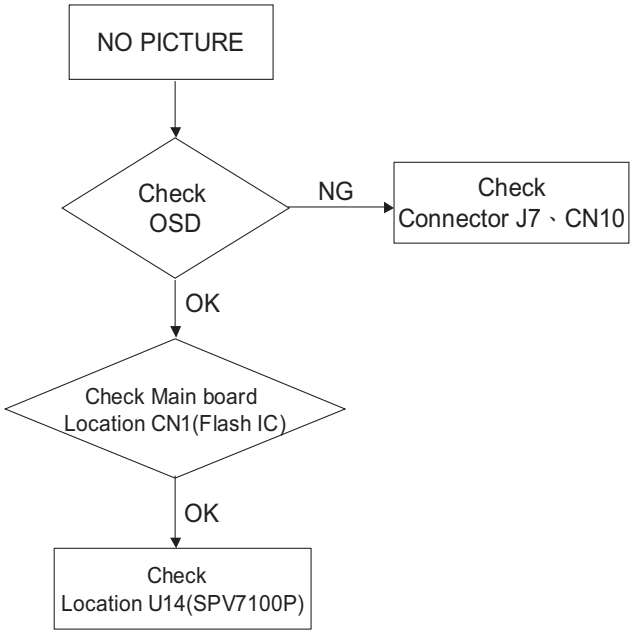
Item	Details
Initial Input	**Off** ↔ **RF** ↔ **AV1** ↔ **AV2** ↔ **AV3** ↔ **YPbPr** ↔ **HDMI1** ↔ **HDMI2** ↔ **HDMI3** ↔ **PC** Adjusts the input signal when the unit is turned on. **Off:** The input signal when the power was last turned off is set. **Note:** This menu is available only when "Input Lock" is "Off". RF mode is available only when Pal Tuner is connected.
Onscreen Display	**Off**: Onscreen information is not displayed. **On**: Onscreen information is displayed, such as: • Power on display • Input signal switch display • No signal display • Mute and the remaining time of off-timer **On 1**: Onscreen information is displayed, except some RS-232C communication information is not displayed.
Initial VOL Level	Used to set the volume level at power-on. **Off**: The volume is set to the same level as when the power was last turned off. **0 to 63**: The volume is set to the selected level. **Note**: It is not possible to select an Initial VOL Level setting which is higher than the Maximum VOL Level setting.
Maximum VOL Level	Used to set the volume level so that it will not exced the maximum setting. **Off**: No restrictions are placed on the volume level. **0 to 63**: The volume is restricted to the selected level. **Note**: It is not possible to select a Maximum VOL Level setting which is lower than the Initial VOL Level setting.
Input Lock	**Off** ↔ **RF** ↔ **AV1** ↔ **AV2** ↔ **AV3** ↔ **YPbPr** ↔ **HDMI1** ↔ **HDMI2** ↔ **HDMI3** ↔ **PC** Locks the input switch operation. **Off:** Input switch can be used. **Note:** RF mode is available only when Pal Tuner is connected.
Button Lock	Used to restrict the operation of the buttons on the main unit. **Off:** All the buttons on main unit can be used. **Menu:** Locks the **Menu** button on the main unit. **On:** Locks all the buttons on the main unit except the **Power** button.
Remocon User Level	**Off** ⟷ **User1** ⟷ **User2** ⟷ **User3** **Off:** You can use all of the buttons on the remote control. **User1:** You can only use POWER, INPUT, OK, MUTE, VOL+ buttons on the remote control. **User2:** You can only use POWER button on the remote control. **User3:** Locks all the buttons on remote control. **Note:** Hotel Mode menu may not be accessible when you select “User2” or “User3”. When this happens, press the **VOL-** on the display and the **OK** button on the remote control at the same time. The message “Are you sure to out the mode?” will appear, select “Yes”.

7 Troubleshooting Guide

7.1. No Power



7.2. No Picture



8 Disassembly and Assembly Instructions

Caution:
Exchange printed circuit board after confirm parts number.

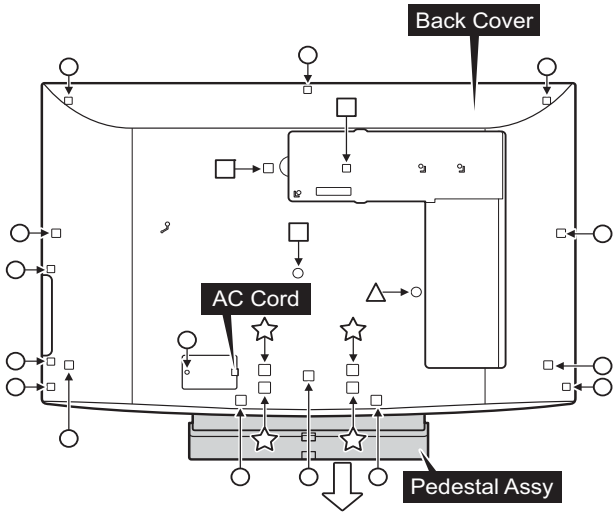
Parts name & Descrption	Parts No.
MAIN PCB	TNM4CD0819FC
POWER PCB	TNM4CD0821F

8.1. TH-32LRT12U-A Instructions

- To disassemble P.C.B., wait for 1 minute after power was off for discharge from electrolysis capacitors.
- ◯, □, △, ⬟, ⇧, and ☆ marks indicate screw positions.

8.1.1. Removal of Pedestal Assy and Back Cover

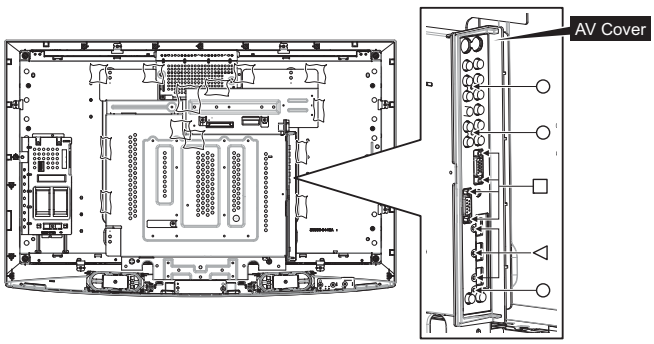
1. Remove screws (x15 ◯, x3 □, x1△, x4☆) and then remove the Pedestal Assy.



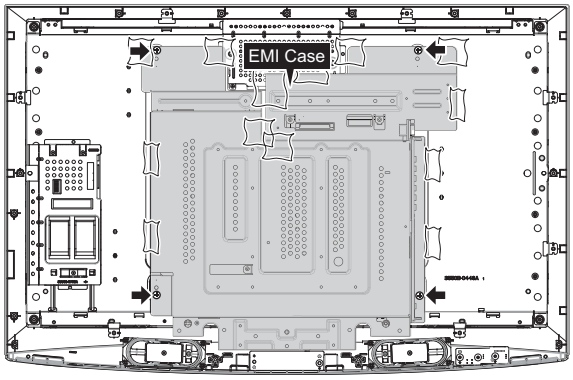
2. Remove the AC cord from the slot.
3. Remove the Back Cover.

8.1.2 Removal of EMI Case Unit

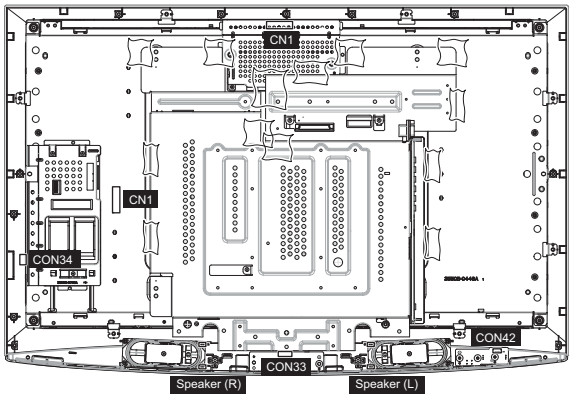
1. Remove screws (x3 ◯, x4 □, x3 △) and then remove the AV cover.



2. Remove 4 screws (⬟), disconnect the connectors and then remove the EMI Case.

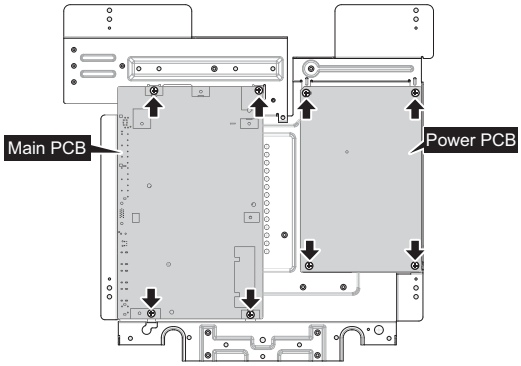


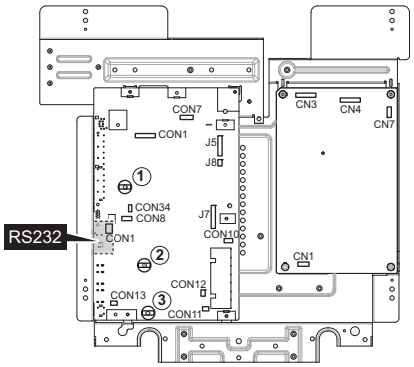
3. Disconnect the connectors including Speaker (R), speaker (L), CON33, CON42, CON34 CN1 (panel inverter), CN1 (panel driver), and remove the 13 foil.



8.1.3 Removal of the Main PCB, Power PCB, and RS232 PCB

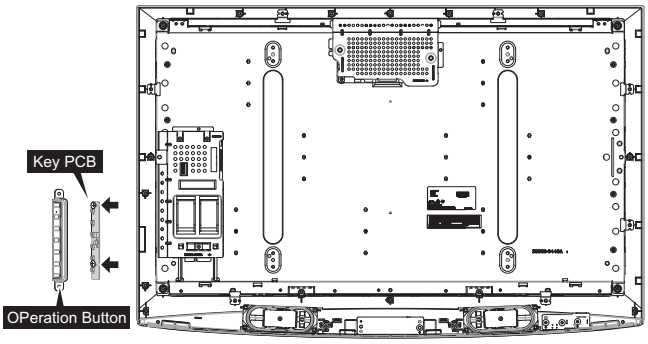
1. Turn the EMI case over and then remove 8 screws.
   - Disconnect the connectors (CON7, CON1, CON34, CON8, CON12, CON11, J5, J7, J8, CON10).
   - Unfasten the wire clip ①, ②, ③.
   - Disconnect the connectors CON1 of the RS232 board.
   - Disconnect the connectors including CN3, CN4, CN7, and CN1 (AC CORD).





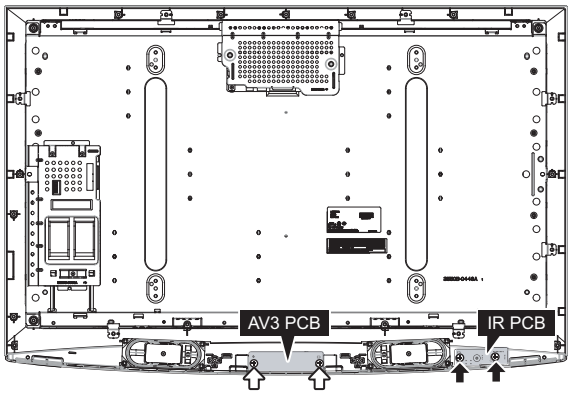
8.1.4 Removal of Operation Button

1. Remove the Operation Button.
2. Remove 2 screws and then remove the key PCB.



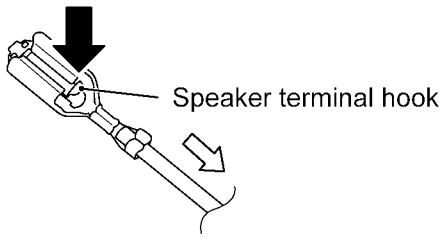
8.1.5 Removal of IR PCB and AV3 PCB

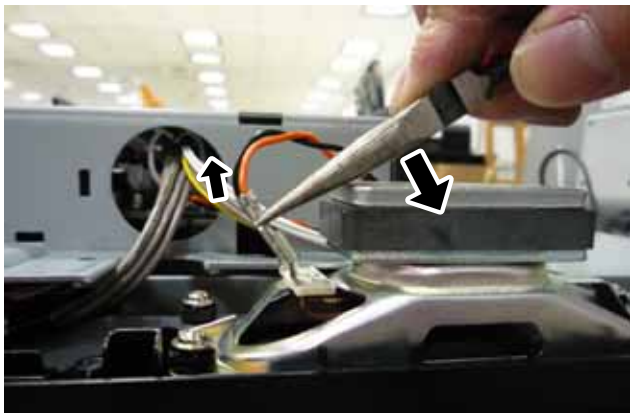
1. Remove 2 screws (⇧) and then remove the IR PCB.
2. Remove 2 screws (⇧) and then remove the AV3 PCB.



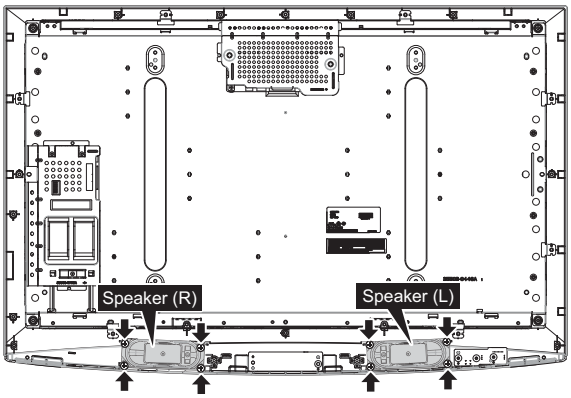
8.1.6 Removal of Speaker (L, R)

1. Connected terminal hook is pushed, and the speaker lead in 4 places is pulled out.
2. To safely remove speaker, see picture below:



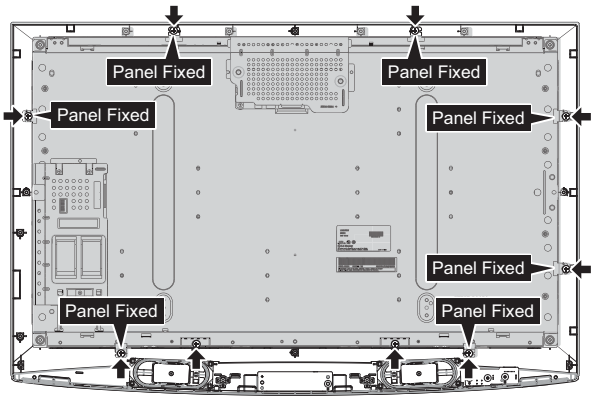


3. Remove 8 screws and then remove the Speaker (L, R).

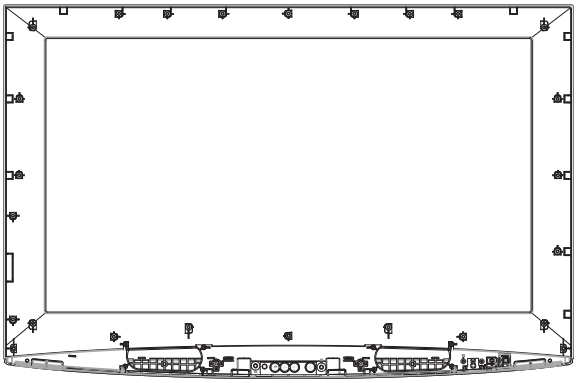


8.1.7 Removal of LCD Panel and Cabinet

1. Remove 11 screws and then remove the Panel Fixed.



2. Remove the LCD Panel from the Cabinet.

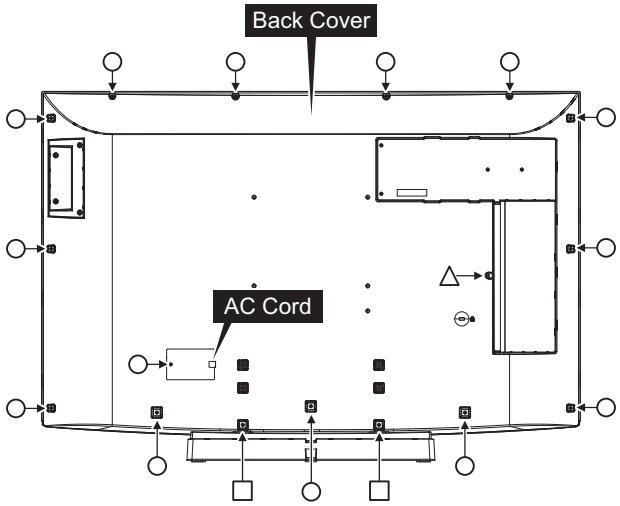


8.2. TH-37LRT12U/M/A Instructions

- To disassemble P.C.B., wait for 1 minute after power was off for discharge from electrolysis capacitors.
- ○, □, △, ⬟, ☆, and ⇧ marks indicate screw positions.

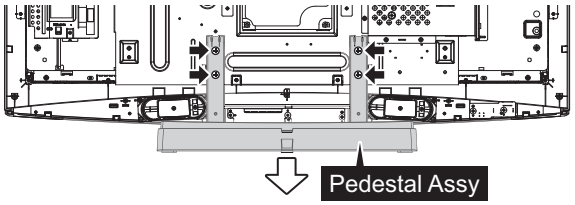
8.2.1 Removal of Back Cover

1. Remove screws (x14 ○, x2 □, x1△) and then remove the Back Cover.
2. Remove the AC cord from the slot.



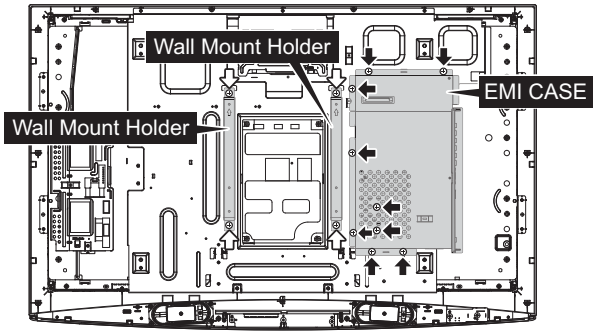
8.2.2 Removal of Pedestal Assy

1. Remove 4 screws (⬟) and then remove the Pedestal Assy.



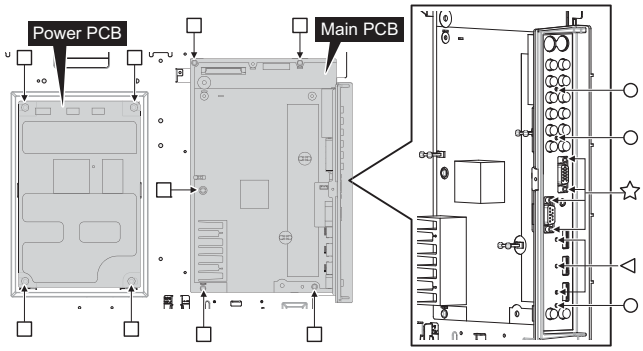
8.2.3 Removal of EMI Case and Wall Mount Holder

1. Remove 9 screws (⬟) and then remove the EMI Case.
2. Remove 4 screws (⇧) and then remove the Wall Mount Holder.

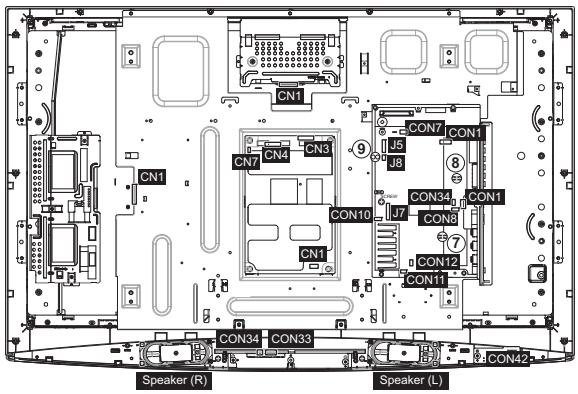


8.2.4 Removal of Main PCB, Power PCB, and RS232 PCB

1. Remove screws (x4 □) of the Power PCB.
2. Remove screws (x5 □, x3 ○, x3 △, x4 ☆) of the Main PCB.
3. Disconnect the connectors CON1 of the RS232 PCB.

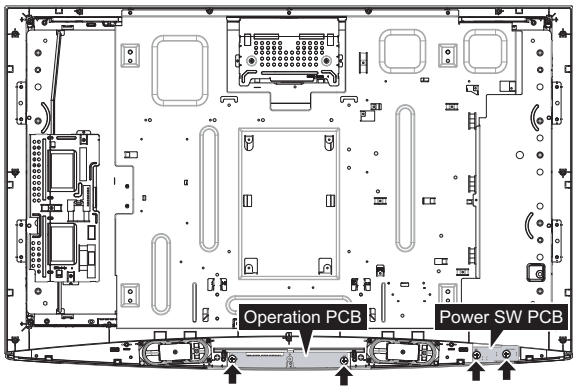


4. Disconnect the connectors (CON7, CON1, CON34, CON8, CON12, CON11, CON10, J5, J8, J7).
   - Disconnect the connectors (CON7, CON1, CON34, CON42, CON8, CON12, CON11, CON10, J5, J8, J7) and then remove the Main PCB.
   - Unscrew ①, ②, ③.
   - Disconnect the connectors (CN3, CN4, CN7, CN1-AC CORD) and then remove the Power PCB.



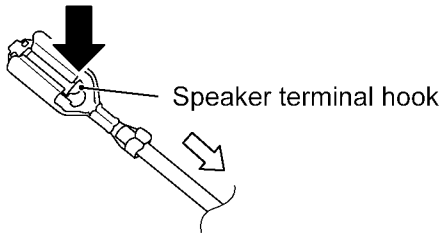
8.2.5 Removal of Power SW PCB and Operation PCB

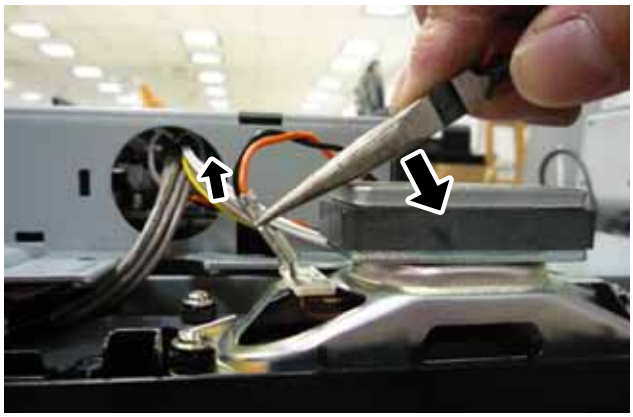
1. Remove 4 screws (⬆) and then remove the Power SW PCB and Operation PCB.



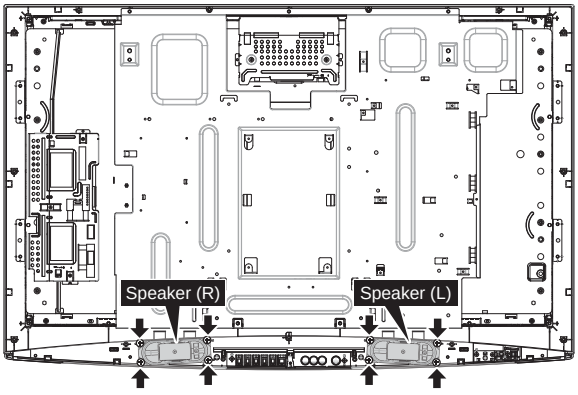
8.2.6 Removal of Speaker (L, R)

1. Connected terminal hook is pushed, and the speaker lead in 4 places is pulled out.
2. To safely remove speaker, see picture below:



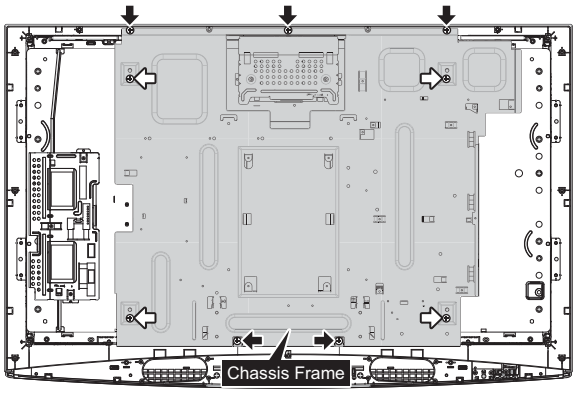


3. Remove 8 screws and then remove the Speaker (L, R).

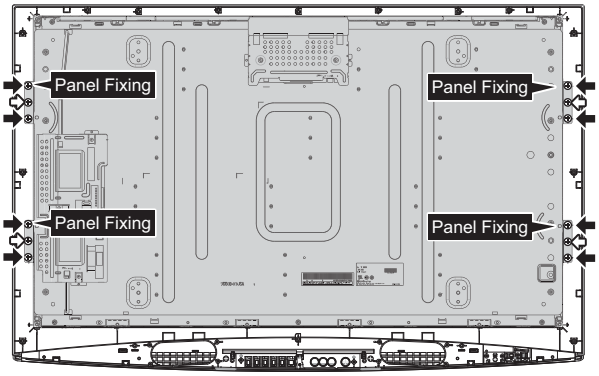


8.2.7 Removal of LCD Panel and Cabinet

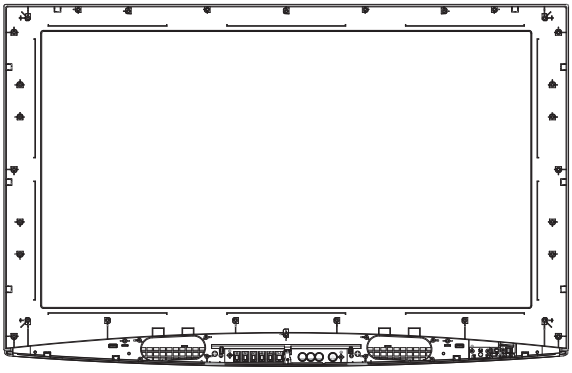
1. Remove screws (x5 ⬆, x4 ⇧) and then remove the Chassis Frame.



2. Remove screws (x8 ⬆, x4 ⇧) and then remove the Panel Fixing.



3. Remove the LCD Panel from the Cabinet.



9 Adjustments and Upgrade

9.1. White Balance Adjustment (TH-32LRT12U-A)

9.1.1. Test Condition

1. Press the "Factory Settings" button on the custom remote or hold down the "Volume+ -" keys on the screen for 3 seconds to access the "Factory Mode".
2. Software Reset: Before screen warm-up, go to option "0F" in factory mode and at "RESET" press the "Left" button on the remote.
3. Screen Burn-in: Go to option "OF" in factory mode and at "BURN IN", press the "Left" button on the remote to switch to "W" then exit factory mode. Allow to burn in for "1 hour". After burn-in, enter factory mode and change "BURN IN" to "OFF" before proceeding with White Balance Adjustment.
4. White Balance Adjustment:
   Set TV to “AV1”; Input signal is H Pattern*.

9.1.2. Low Light Adjustment

1. In option "0A" under factory mode, use "R OFFSET" and "B OFFSET" to set the hue and brightness.

	Adjustment (auto)	Adjustment (manual)	Confirmation
x(cd/m^2)	0.280±0.003	0.280±0.005	0.280±0.01
y(cd/m^2)	0.285±0.003	0.285±0.005	0.285±0.01
Y(cd/m^2)	3±0.5	3±0.5	3±0.5

9.1.3. High Light Adjustment

1. In option "0A" under factory mode, use "R GAIN" and "B GAIN" to set the hue and brightness.

	Adjustment (auto)	Adjustment (manual)	Confirmation
x(cd/m^2)	0.280±0.003	0.280±0.005	0.280±0.01
y(cd/m^2)	0.285±0.003	0.285±0.005	0.285±0.01
Y(cd/m^2)	200±1.0	200±1.0	200±15.0

9.2. White Balance Adjustment (TH-37LRT12U/M/A)

9.2.1. Test Condition

1. Press the "Factory Settings" button on the custom remote or hold down the "Volume+ -" keys on the screen for 3 seconds to access the "Factory Mode".
2. Software Reset: Before screen warm-up, go to option "0F" in factory mode and at "RESET" press the "Left" button on the remote.
3. Screen Burn-in: Go to option "OF" in factory mode and at "BURN IN", press the "Left" button on the remote to switch to "W" then exit factory mode. Allow to burn in for "1 hour". After burn-in, enter factory mode and change "BURN IN" to "OFF" before proceeding with White Balance Adjustment.
4. White Balance Adjustment:
   Set TV to “AV1”; Input signal is H Pattern*.

9.2.2. Low Light Adjustment

1. In option "0A" under factory mode, use "R OFFSET" and "B OFFSET" to set the hue and brightness.

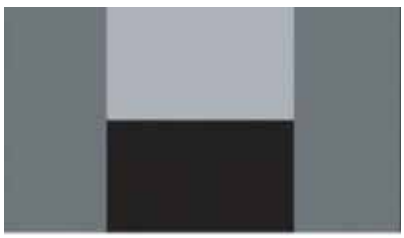
	Adjustment (auto)	Adjustment (manual)	Confirmation
x(cd/m^2)	0.280±0.003	0.280±0.005	0.280±0.01
y(cd/m^2)	0.285±0.003	0.285±0.005	0.285±0.01
Y(cd/m^2)	3.5±0.5	3.5±0.5	3.5±0.5

9.2.3. High Light Adjustment

1. In option "0A" under factory mode, use "R GAIN" and "B GAIN" to set the hue and brightness.

	Adjustment (auto)	Adjustment (manual)	Confirmation
x(cd/m^2)	0.280±0.003	0.280±0.005	0.280±0.01
y(cd/m^2)	0.285±0.003	0.285±0.005	0.285±0.01
Y(cd/m^2)	200±1.0	200±1.0	200±15.0

*** H Pattern:**

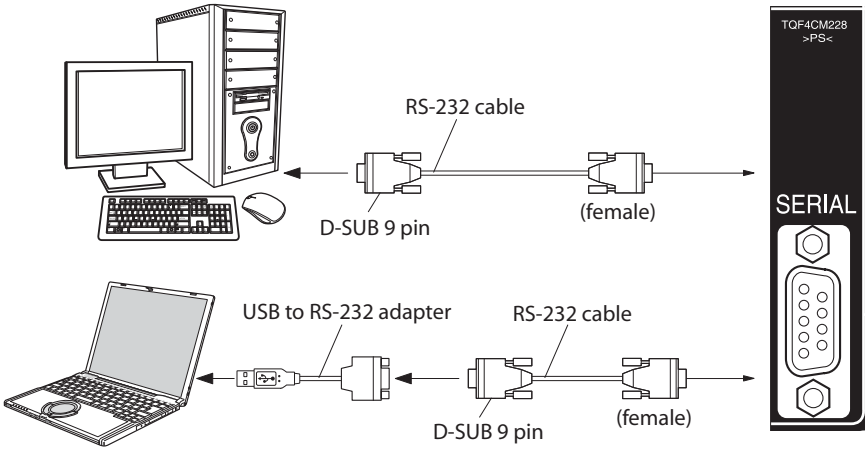


9.3. Software Upgrade

9.3.1. Main micon eeprom upgrade

How to upgrade:

1. Turn on the display and enter into Factory mode.
2. Use an RS232 cable to connect the display with the computer. The way of connection is shown below:
3. When using a notebook computer for upgrade, use a USB to RS-232 adapter to connect the RS-232 cable to the notebook, then connect the RS-232 cable to the display. (Connect the 9th pin of the RS-232 cable to the ground.)

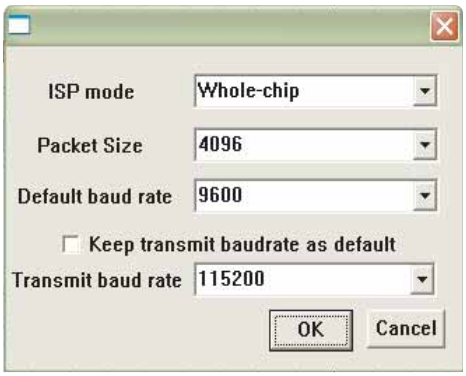


4. Record **0A** 6 groups of values as marked below:

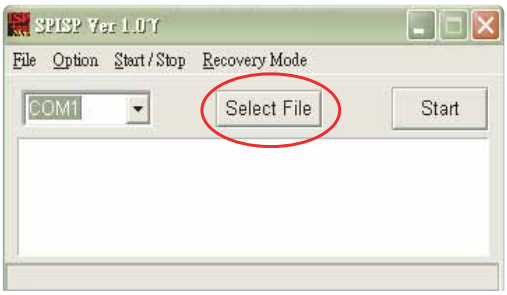
```
SPV7100   FACTORY   MENU
OA          OD  OE  OF
SPV7100  PICTURE
R  OFFSET          0x7A
G  OFFSET          0x7A
B  OFFSET          0x7A
R  GAIN            0x80
G  GAIN            0x80
B  GAIN            0x80
516  CONTRAST      0x85
516  BRIGHTNESS    0x1A
516  SATURATION    0x90
516  HUE           0x00
H  PEAK  BP  GAIN  0x02
H  PEAK  HP  GAIN  0x0D
H  PEAK  LP  GAIN  0x04
H  PEAK  CORING    0x00
H  PEAK  CLIP      0x0F
V  PEAK  GAIN      0x18
V  PEAK  CLIP      0x10
NR                 OFF
PHASE              0x00
NTSCM          056A0220
TH-32LRTA  V3.0  090901
WTCodeVersion   V3.0
```

4. Use a 9 pin D-SUB cable to connect the display with the computer.
5. Open ISP TOOL software on the computer.
6. Select the connected COM port of the computer in the drop-down list.

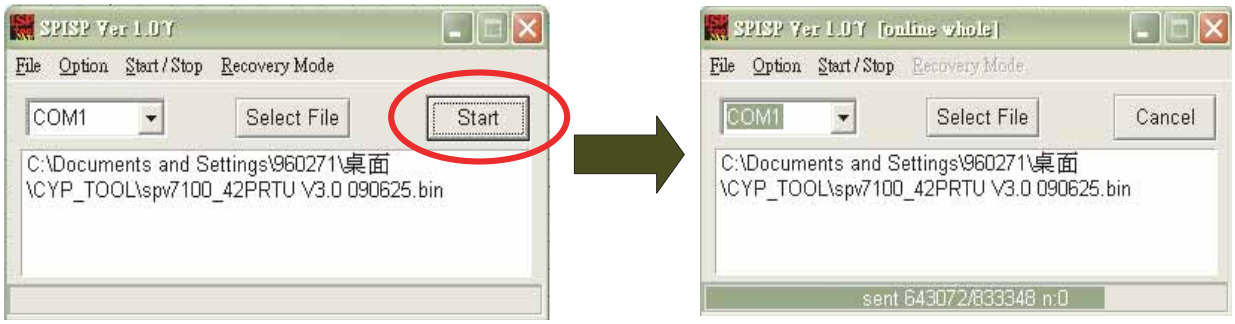
7. Select **Option** on the main bar, then change the setting values as below:



8. Click **Select File** to choose the upgrade file.

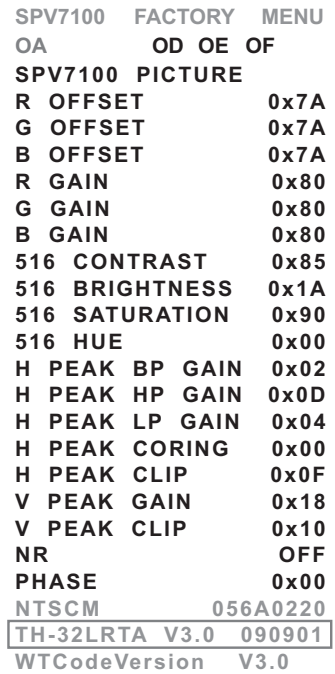


9. Click **Start** to begin upgrading.

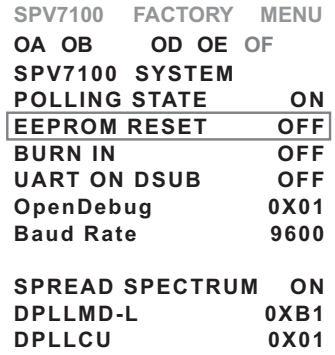


10. When upgrade is completed, a window appears as shown below. Then unplug the display after at least 3 seconds.

11. Plug in the power cord, turn on the display, and enter into Factory mode again to check if software has been upgraded.



12. Select **0F** in the main items and **EEPROM RESET** in the sub items, then change **OFF** to **ON**.



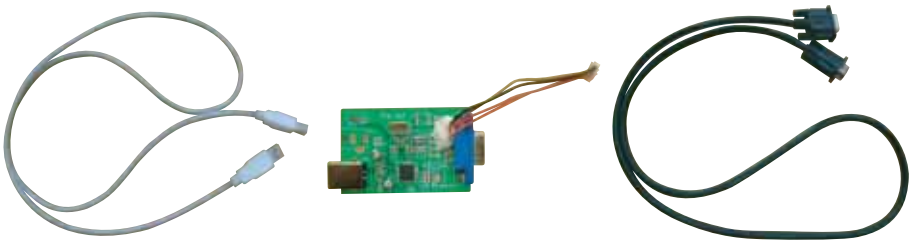
13. After at least 10 seconds, the upper right corner will display **HDMI1** to indicate that software upgrade of main micon eeprom is completed.
14. Enter into Factory mode (**0A**) again and input all 6 groups of values recorded before software upgrade.
15. Perform YPbPr mode AUTO WHITE:
    Set input to YPbPr mode and enter H Patter 1080i. Go to (**0B**) menu under factory mode and run [**ADC Auto White**]. Wait for auto adjustment to finish.
16. Perform PC mode AUTO WHITE:
    Exit factory mode and set input to **PC** and input Color BAR XGA. Go to (**0B**) menu under factory mode and run [**ADC Auto White**]. Wait for auto adjustment to finish.

NOTE: 1. Perform steps 13 and 14 every time you upgrade main micon eeprom software..
2. The gray H pattern should be inputted when AUTO WHITE for YPbPr mode.
3. If 6 groups of values in Factory mode (**0A**) were not recorded before upgrade, you have to adjust the white balance settings manually according to the procedures of white balance adjustment in the previous section.

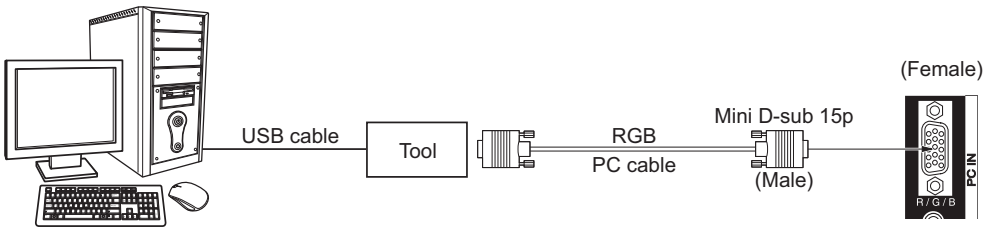
9.3.2. Sub micon upgrade

How to upgrade:

1. Get and install Weltrend MCU ISP software.
2. Use a USB cable, a sub micon tool, and a 15 pin D-SUB cable to connect the LCD TV with the computer. The way of connection is shown below:



USB cable　　Sub micon tool　　15 pin D-SUB cable



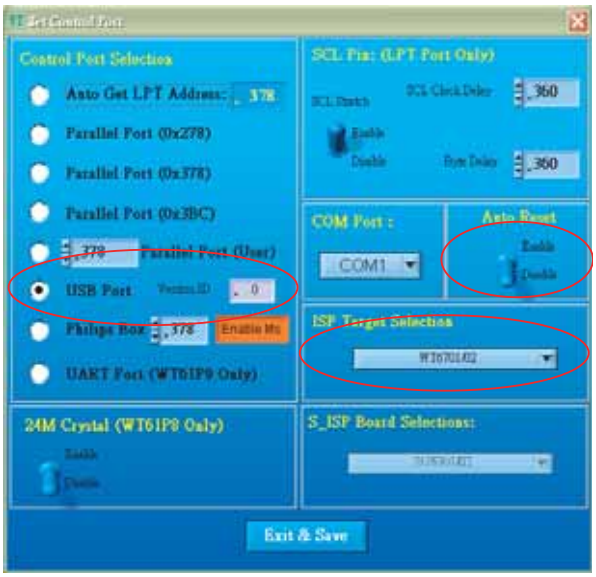
3. Turn on the display and enter into Factory mode.
4. Select **0F** in the main items and **UART ON DSUB** in the sub items, then change **OFF** to **ON**.

```
SPV7100   FACTORY   MENU
OA  OB      OD  OE  OF
SPV7100  SYSTEM
POLLING STATE          ON
EEPROM RESET          OFF
BURN IN               OFF
UART ON DSUB          OFF
OpenDebug            0X01
Baud Rate            9600

SPREAD SPECTRUM       ON
DPLLMD-L             0XB1
DPLLCU               0X01
```

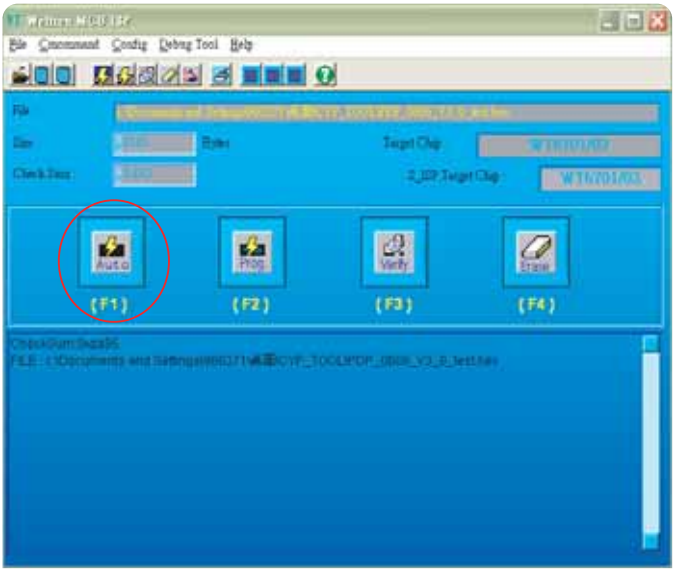
5. Open Weltrend MCU ISP software on the computer.

6. Select **Config** on the menu bar then select **Interface**. Next, adjust the settings as shown below:



7. Click **Exit & Save**.
8. Select **File** on the menu bar and select **Load File**. Next, choose the upgrade file.

9. Click **Auto** to begin upgrading.

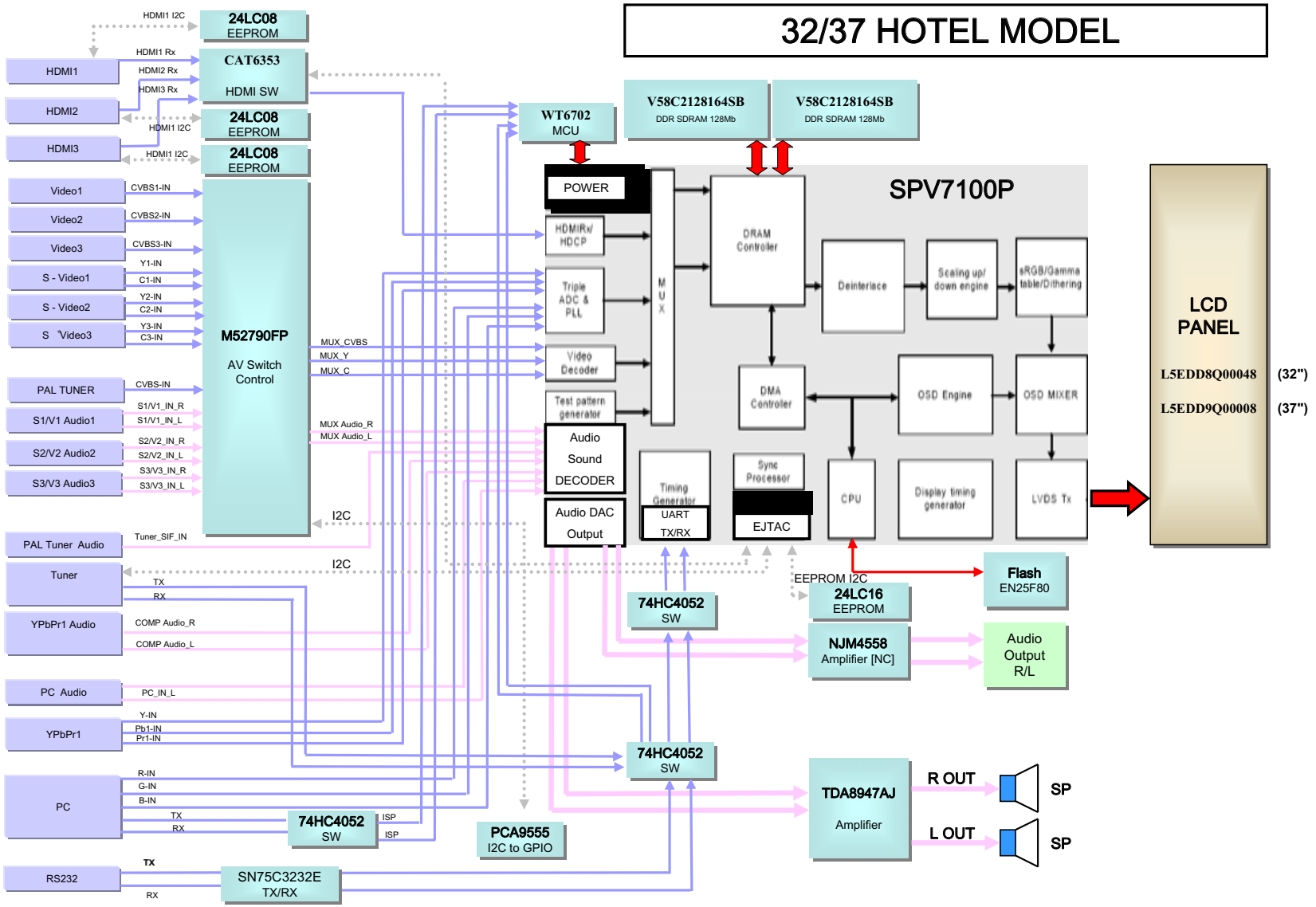


10. When upgrade is completed, enter into Factory mode to check the version as marked below:

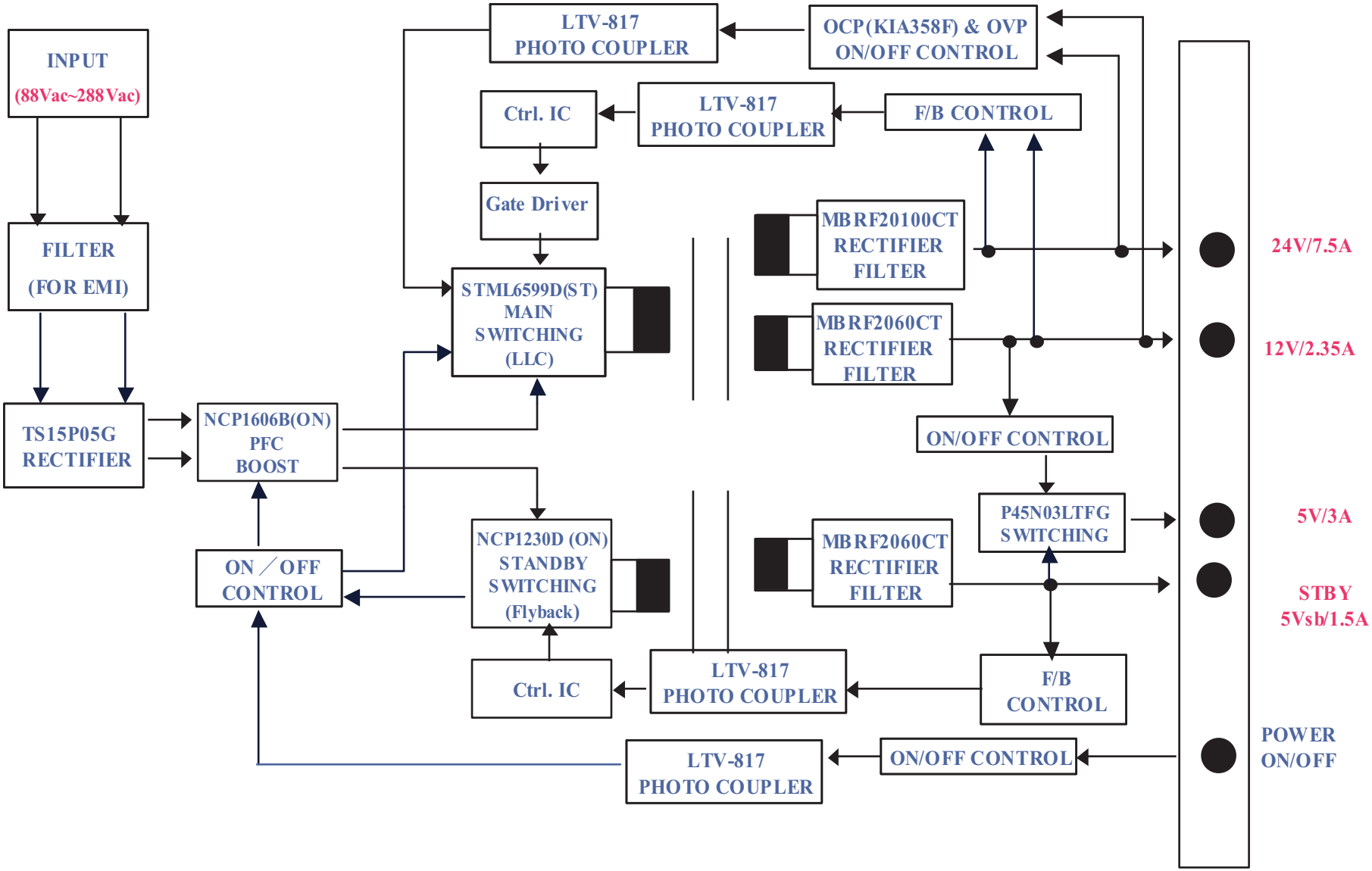
```
SPV7100  FACTORY  MENU
OA          OD  OE  OF
SPV7100  PICTURE
R  OFFSET          0x7A
G  OFFSET          0x7A
B  OFFSET          0x7A
R  GAIN            0x80
G  GAIN            0x80
B  GAIN            0x80
516  CONTRAST      0x85
516  BRIGHTNESS    0x1A
516  SATURATION    0x90
516  HUE           0x00
H  PEAK  BP  GAIN  0x02
H  PEAK  HP  GAIN  0x0D
H  PEAK  LP  GAIN  0x04
H  PEAK  CORING    0x00
H  PEAK  CLIP      0x0F
V  PEAK  GAIN      0x18
V  PEAK  CLIP      0x10
NR                 OFF
PHASE              0x00
NTSCM         056A0220
TH-32LRTA  V3.0  090901
WTCodeVersion   V3.0
```

10 Block Diagram

10.1. System Block Diagram

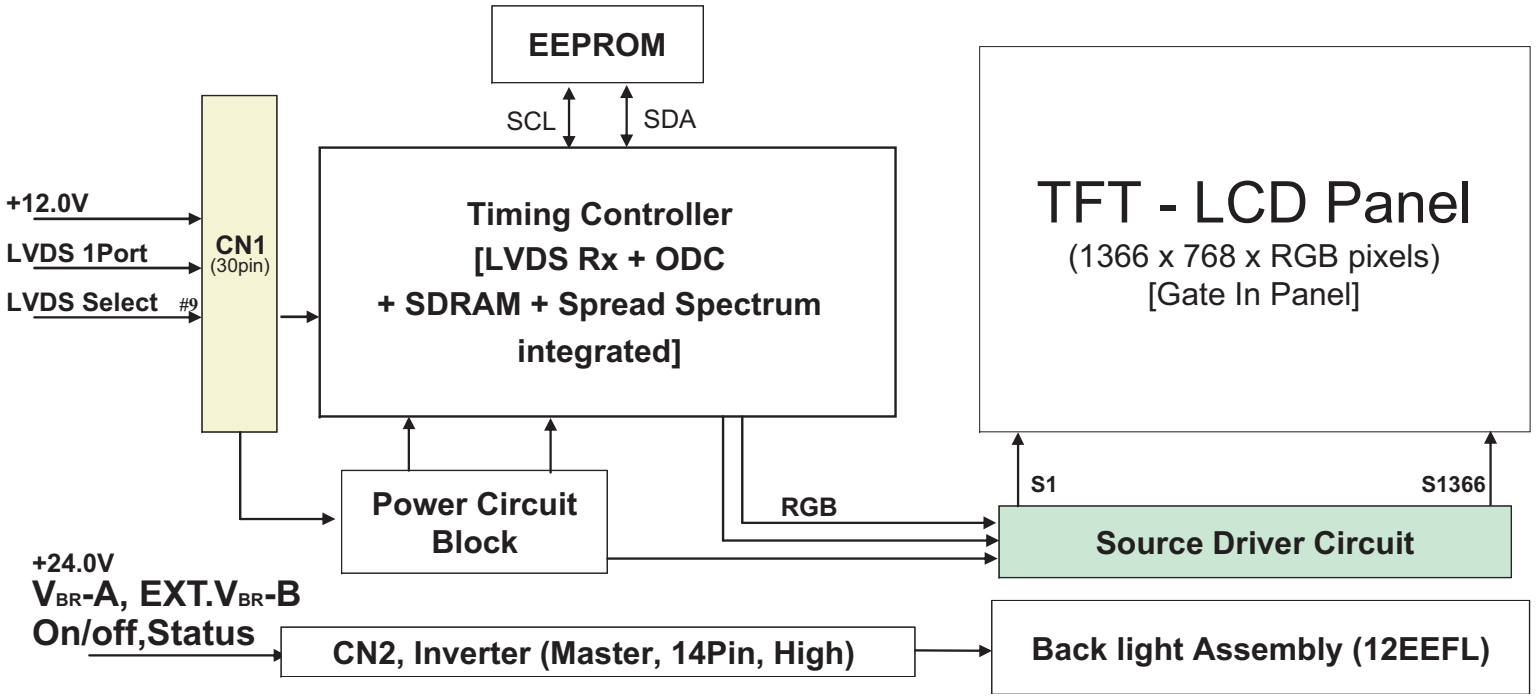


10.2. Power Unit Block Diagram for TH-32LRT12U-A

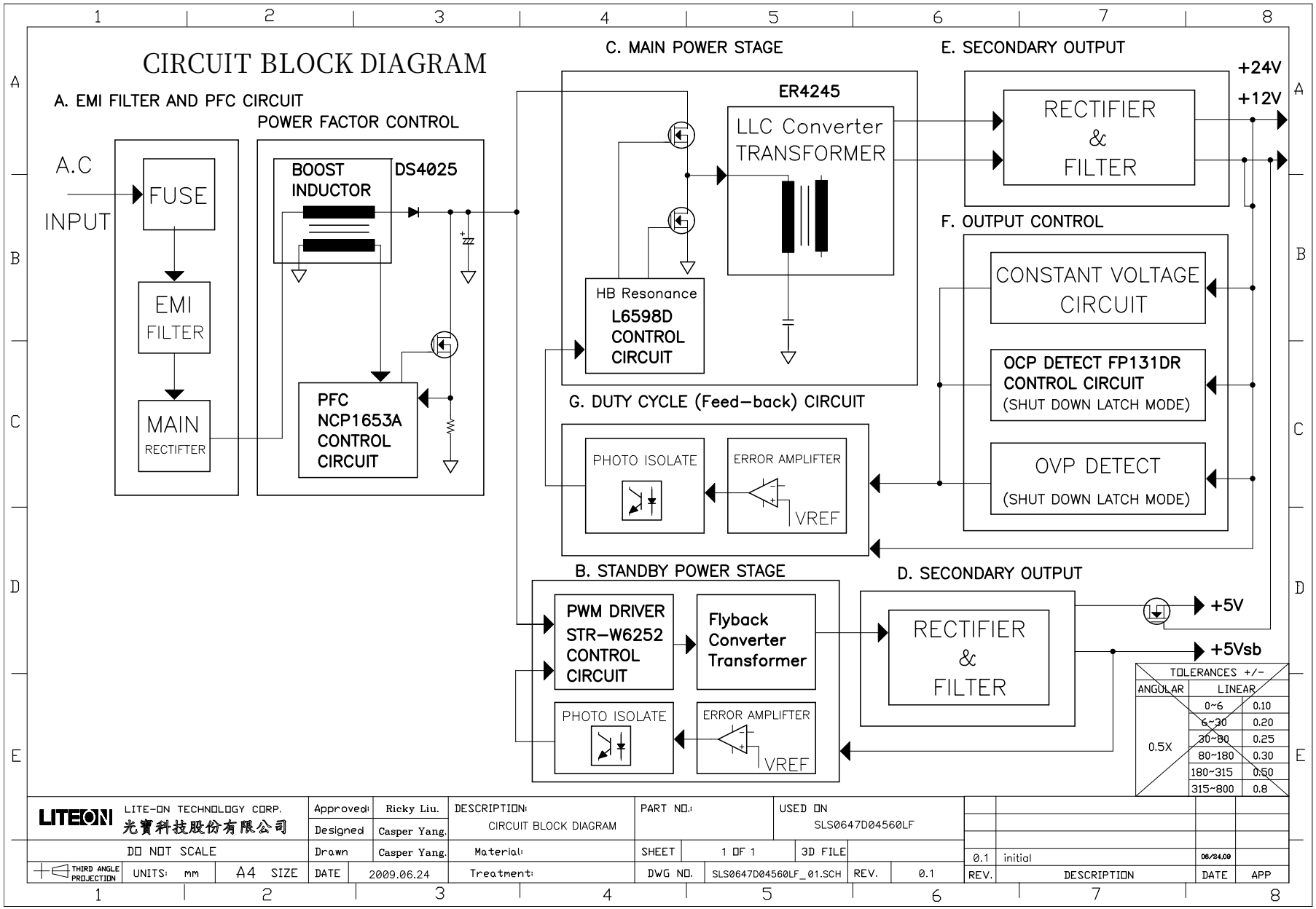


10.3. Panel Block Diagram for TH-32LRT12U-A

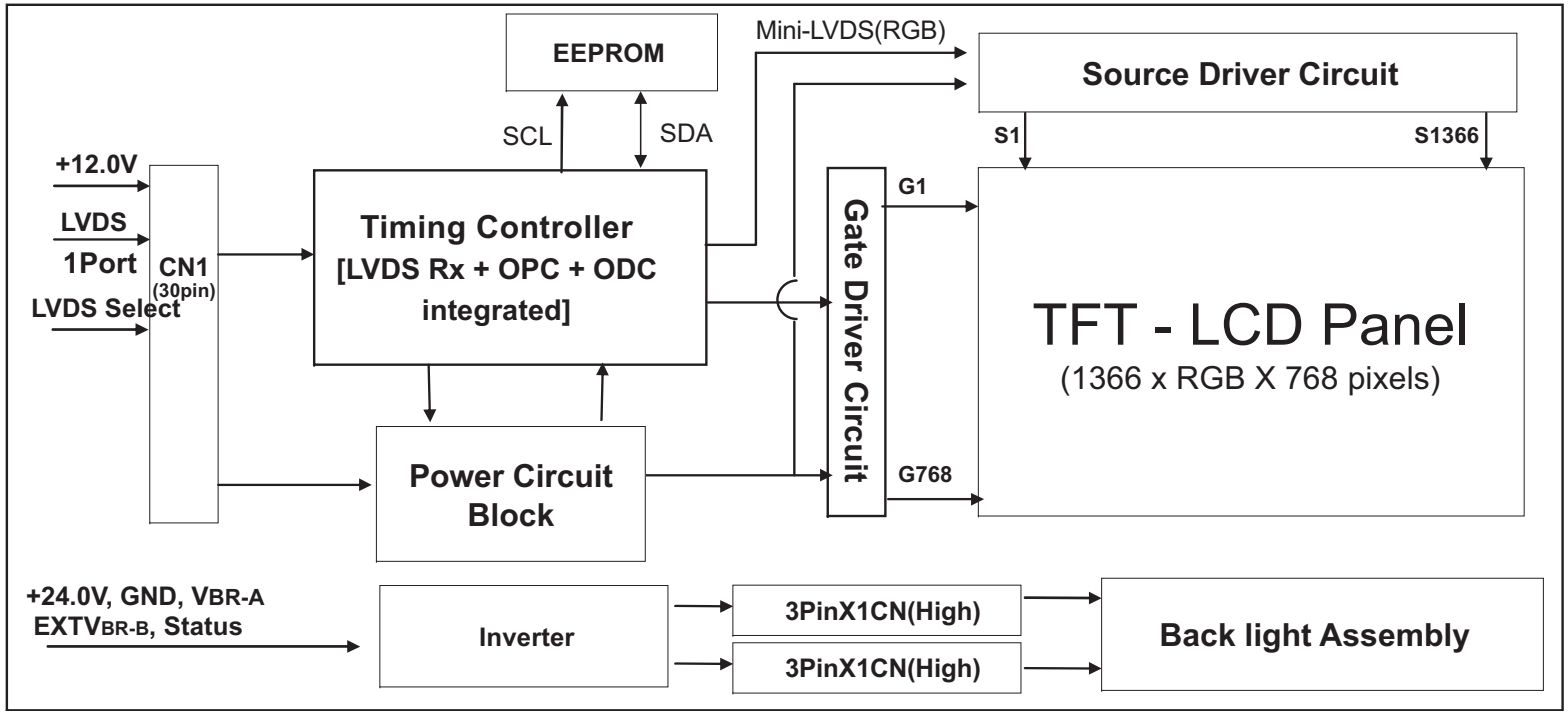
TH-32LRT12U-A
LC320WXN-SBC1 PANEL BLOCK DIAGRAM



10.4. Power Unit Block Diagram for TH-37LRT12U/M/A

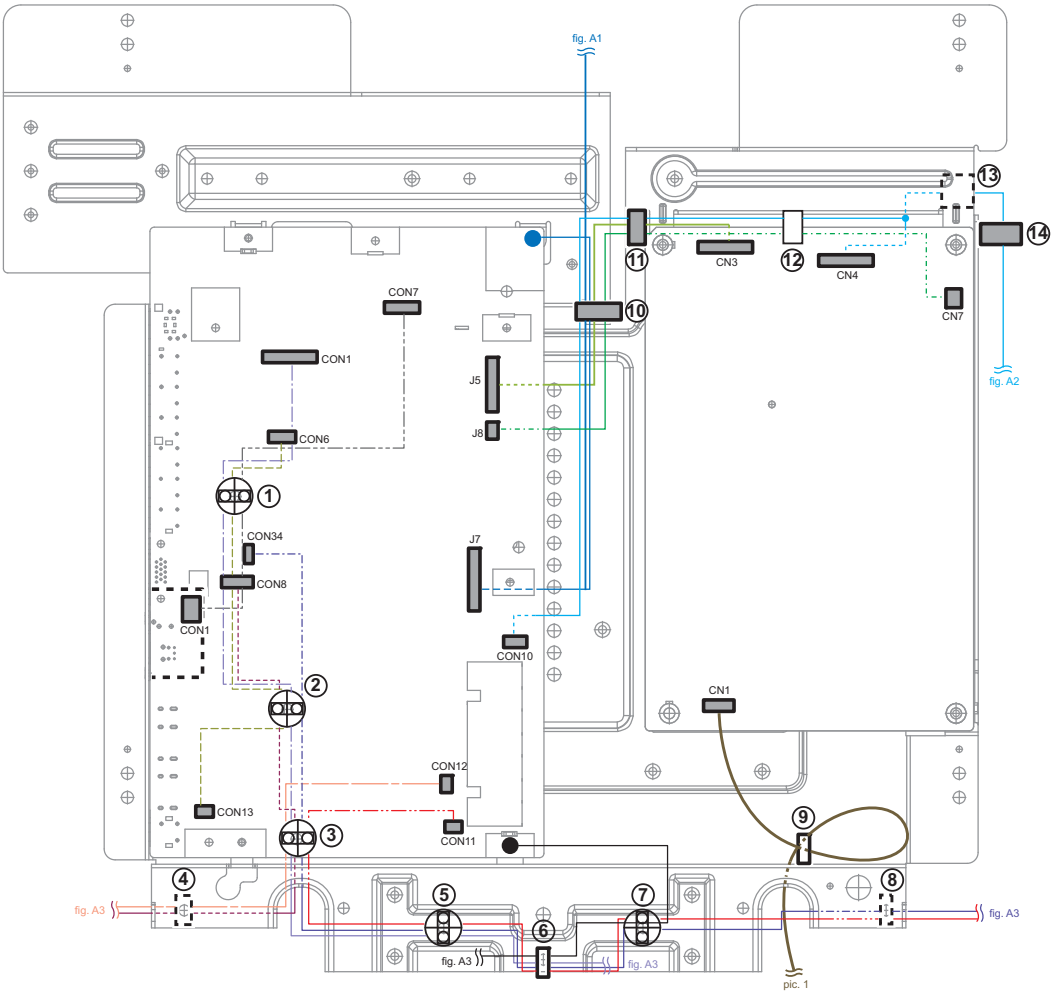


10.5. Panel Block Diagram for TH-37LRT12U/M/A



11 Wiring Connection Diagram

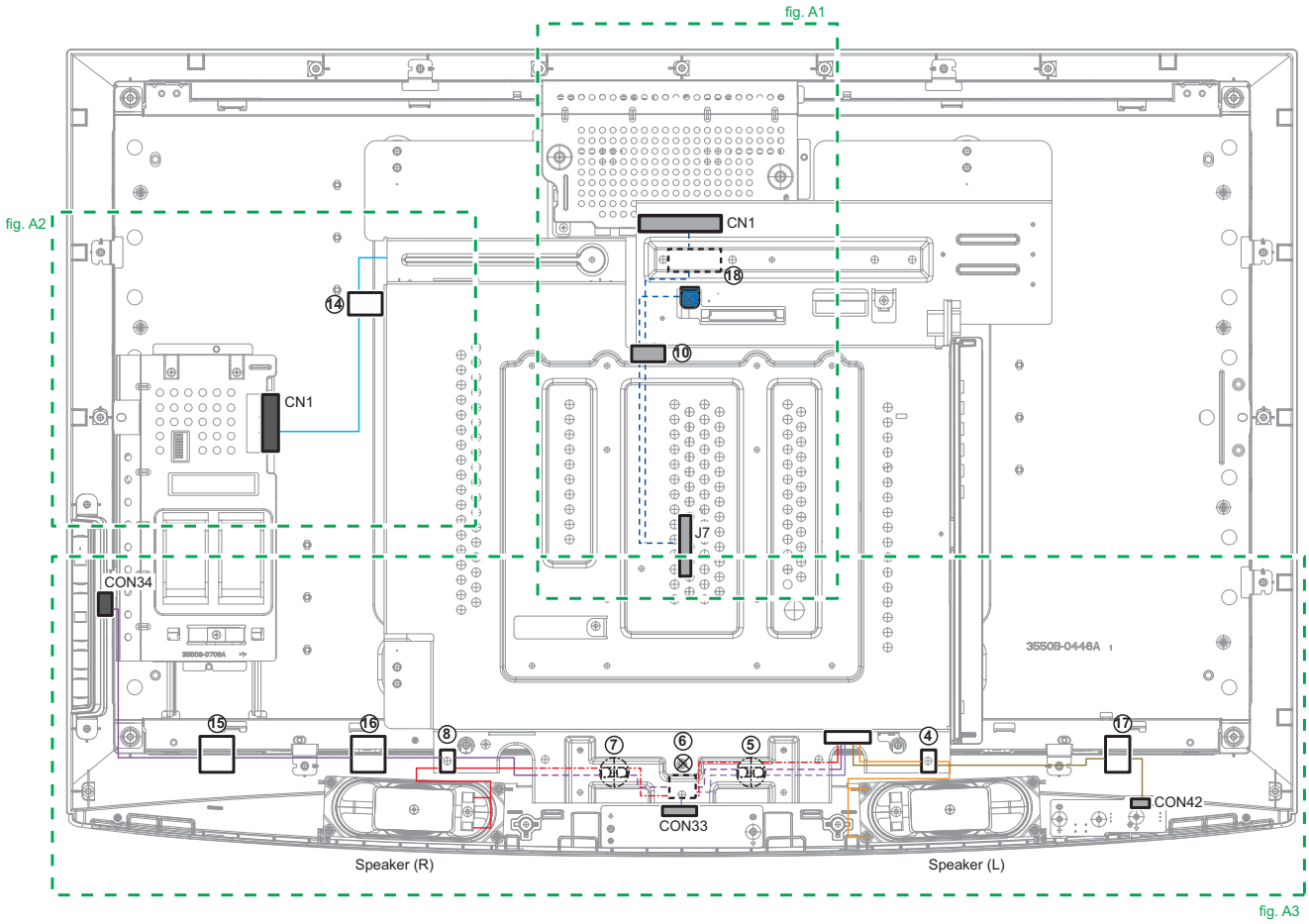
11.1. Wiring (1) TH-32LRT12U-A



Clamp Position

CON:NO - CON:NO	1	2	9	10	11	12
CONA6 - CON13	O	O				
J5 - CN3				O	O	
J8 - CN7				O	O	O
CN1 - AC Cord			O			
CON7 - CON1	O					

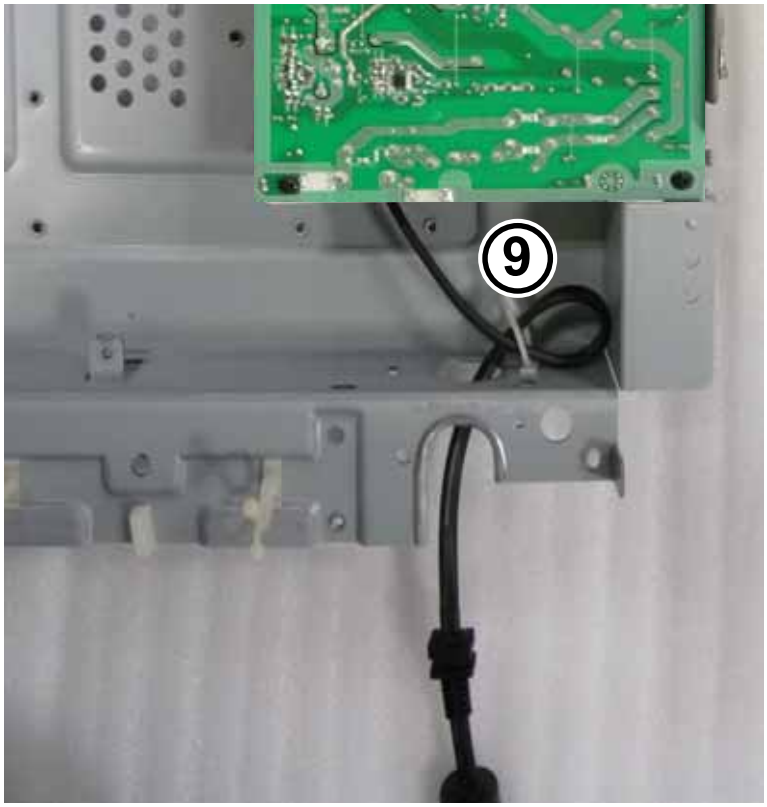
11.2. Wiring (2) TH-32LRT12U-A



Clamp Position

CON:NO - CON:NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
J7 - CN1										O								O		
J7 -										O										
CN1 - CN10										O	O	O	O	O						
CN1 - CN4													O	O						
CON1 - CON33	O	O	O		O	O														
CON34 - CON34		O	O		O	O	O	O							O	O				
CON8 - CON42		O	O	O													O			
CONA6 - CON13	O	O																		
J8 - CN7										O	O	O								
J5 - CN3										O	O									
CON12 - Speaker (L)			O	O																
CON11 - Speaker (R)			O		O	O	O	O												
CON7 - CON1	O																			
CN1 - AC cord									O											

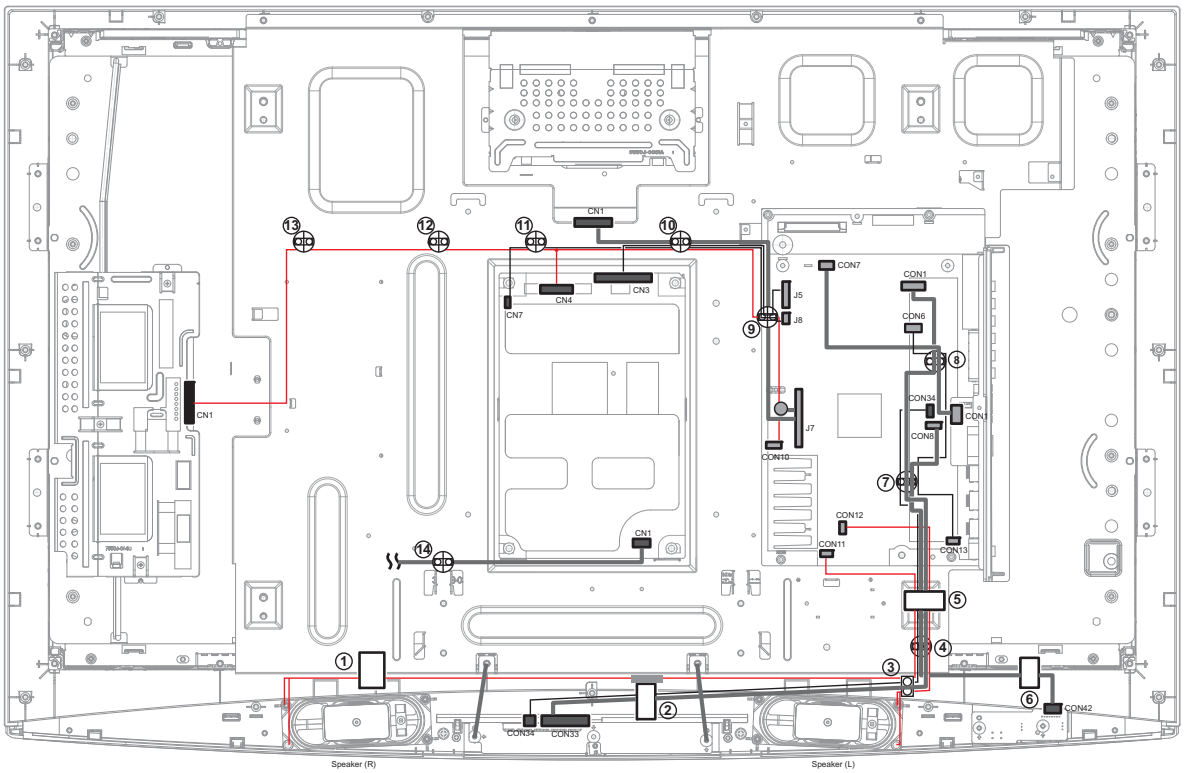
11.3. Wiring (3) TH-32LRT12U-A



Clamp Position

CON:NO - CON:NO	9
CN1 - AC Cord	O

11.4. Wiring (4) TH-37LRT12U/M/A



Clamp Position

CON:NO - CON:NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
J7 - CN1									O	O						
J7 -	No Clamp															
CN1 - CN10									O	O	O	O	O			
CN1 - CN4											O	O	O			
CON1 - CON33		O	O	O	O		O	O								
CON34 - CON34		O	O	O	O		O									
CON8 - CON42				O	O	O	O									
CONA6 - CON13							O	O								
J8 - CN7									O	O	O					
J5 - CN3									O	O						
CON12 - Speaker (L)			O	O	O											
CON11 - Speaker (R)	O	O	O	O	O											
CON7 - CON1								O								
CN1 - AC cord														O		

12 Schematic Diagram

12.1. Schematic Diagram Notes

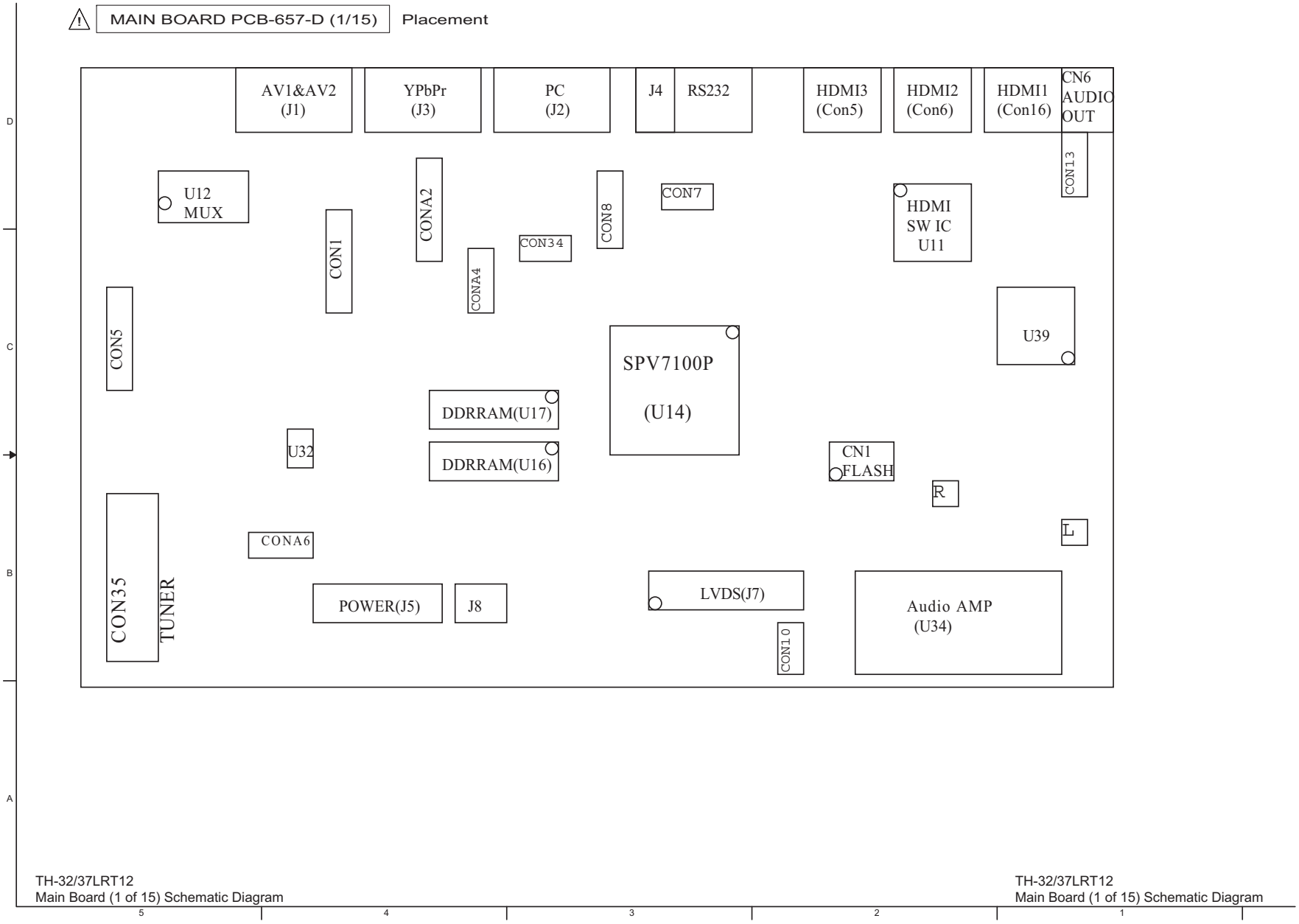
Notes:

1. **Resistor**
   Unit of resistance is OHM [Ω] (K=1,000, M=1,000,000)
2. **Capacitor**
   Unit of capacitance is μF, unless otherwise noted.
3. **Coil**
   Unit of inductance is H, unless otherwise noted.
   ⚲ : Test Point position
   ⏚ / S GND: Chassis Earth (Cold)
   P GND: Line Earth (Hot)
4. **Voltage Measurement**
   Voltage is measured by a DC voltmeter.
   Conditions of the measurement are the following:
   Power Source ..... AC110-127V, 50/60Hz / 220-240V, 50/60Hz
   Receiving Signal ..... Colour Bar signal (RF)
   All customer's control ..... Maximum positions
5. This schematic diagram is the latest at the time of printing and subject to change without notice.

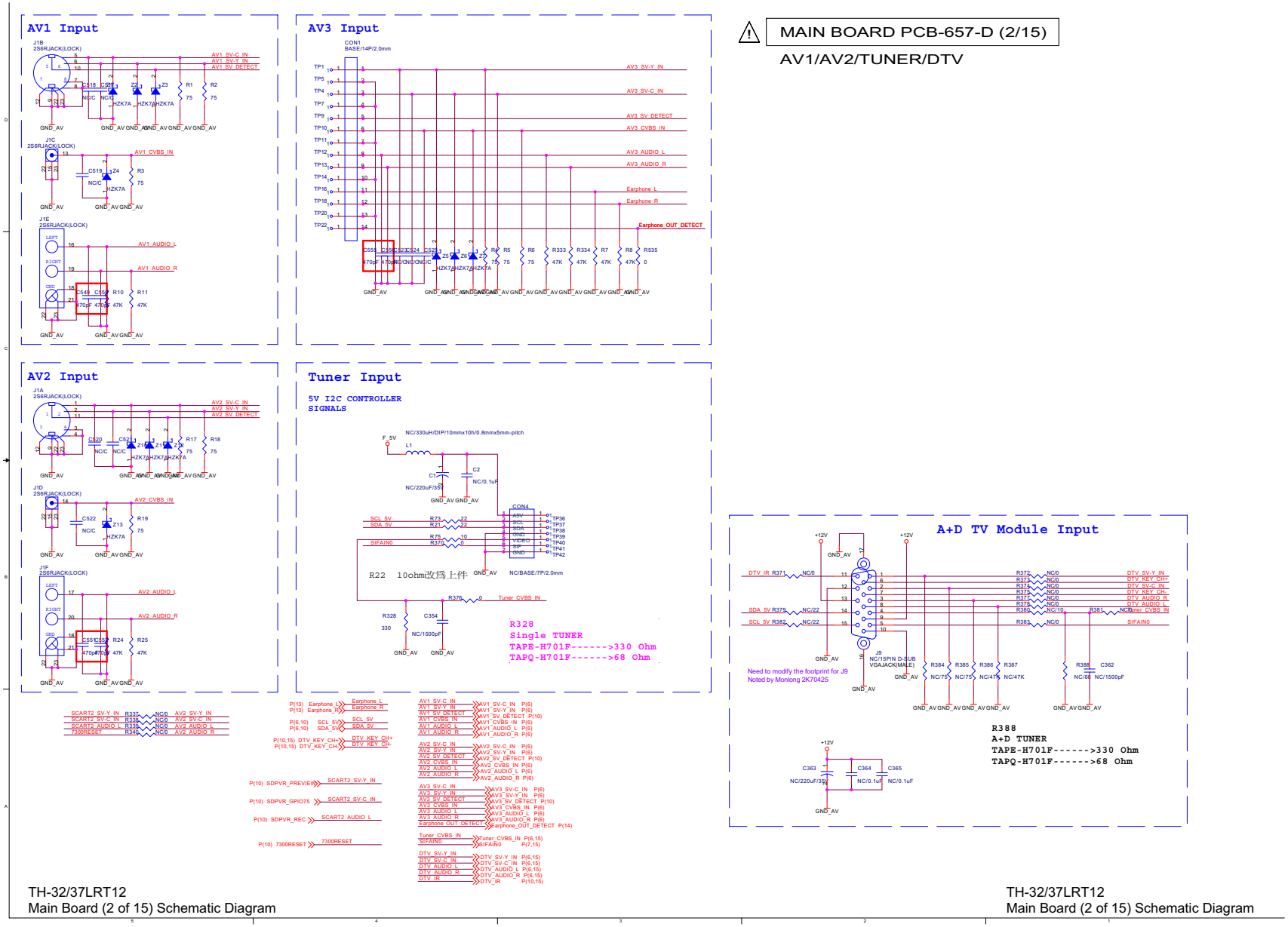
Remarks:

1. The Power Circuit contains a circuit area which uses a separate power supply or you may be shocked.
   The circuit defined by HOT and COLD indications in the schematic diagram. Take the following precautions.
   All circuits, except the Power Circuit, are cold.
   Precautions:
   a. Do not touch the hot part or the hot and cold parts at the same time or you may be shocked.
   b. Do not short-circuit the hot and cold circuits or a fuse may blow and parts may break.
   c. Do not connect an instrument, such as an oscilloscope, to the hot and cold circuits simultaneously or a fuse may blow.
   d. Make sure to disconnect the power plug before removing the chassis.

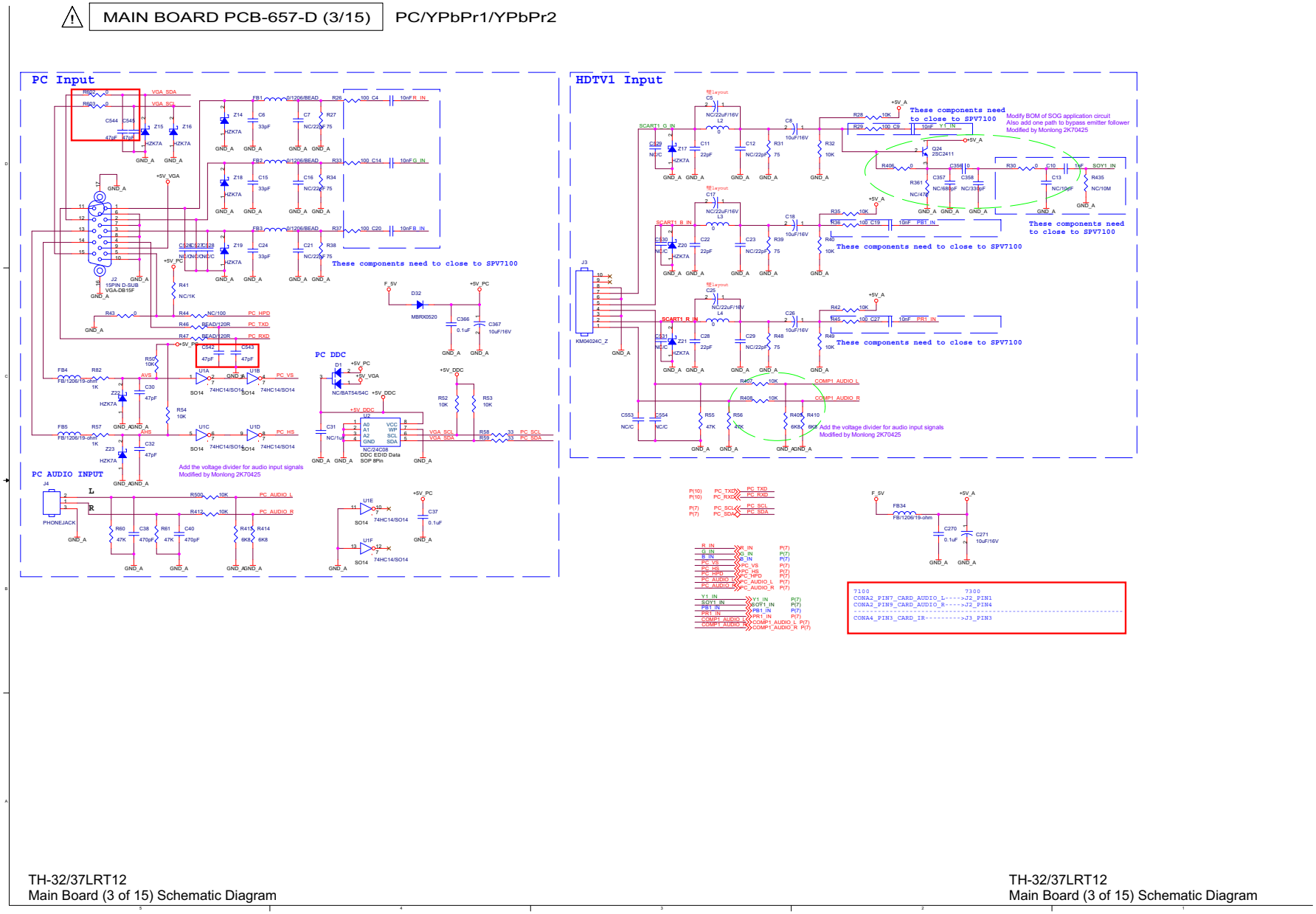
12.2. Main Board (1 of 15) Schematic Diagram



12.3. Main Board (2 of 15) Schematic Diagram

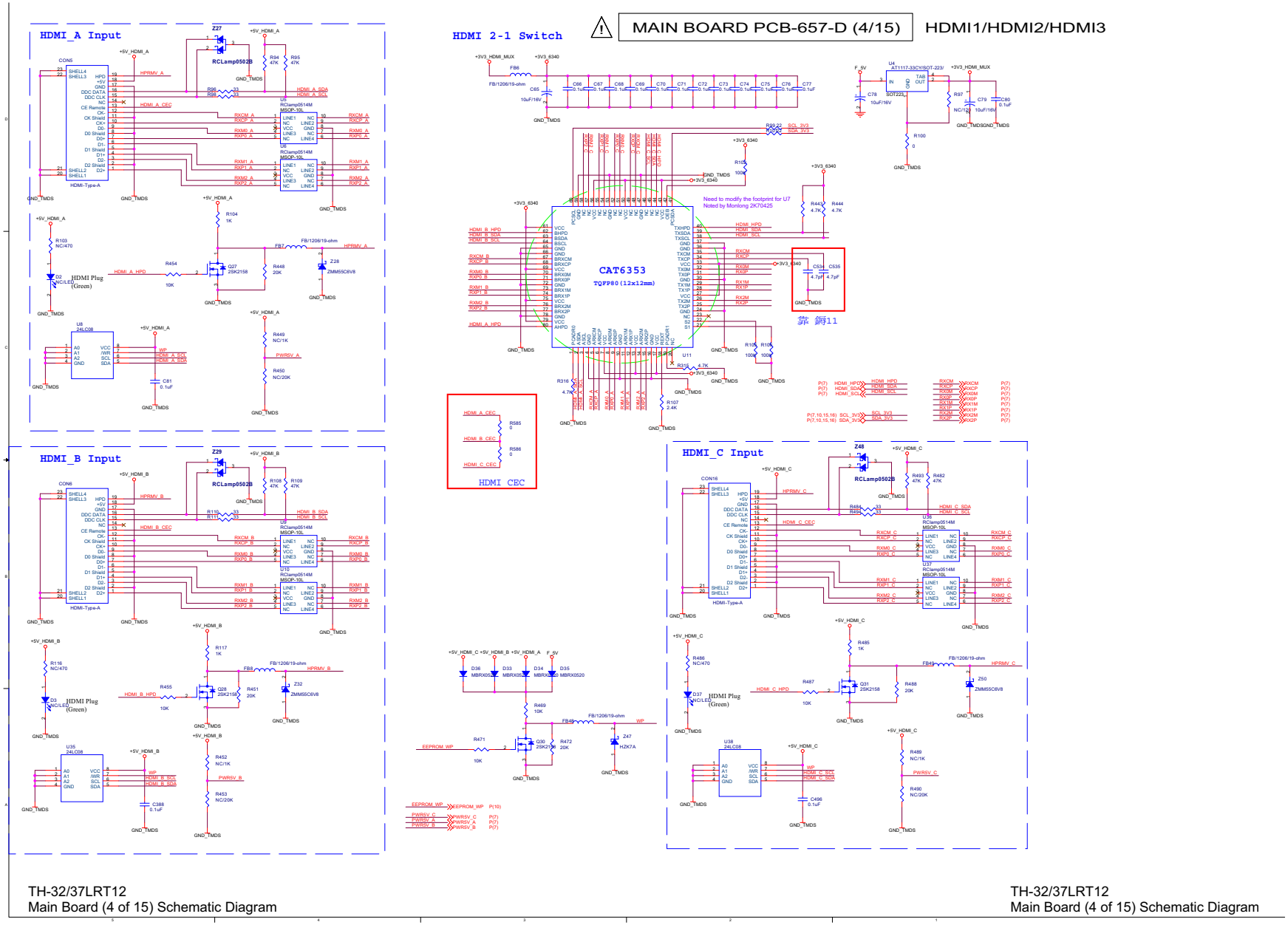


12.4. Main Board (3 of 15) Schematic Diagram



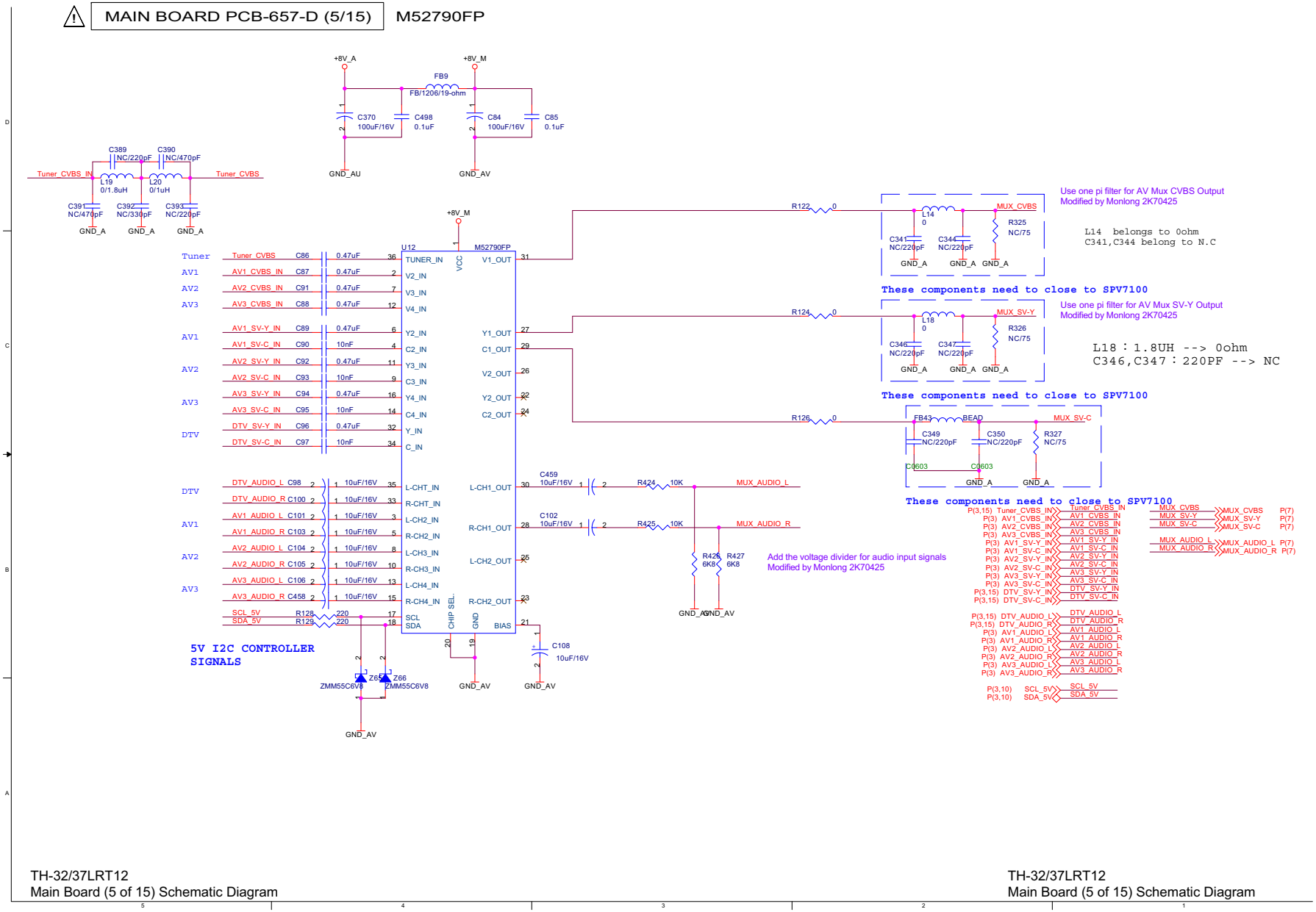
TH-32/37LRT12
Main Board (3 of 15) Schematic Diagram

12.5. Main Board (4 of 15) Schematic Diagram

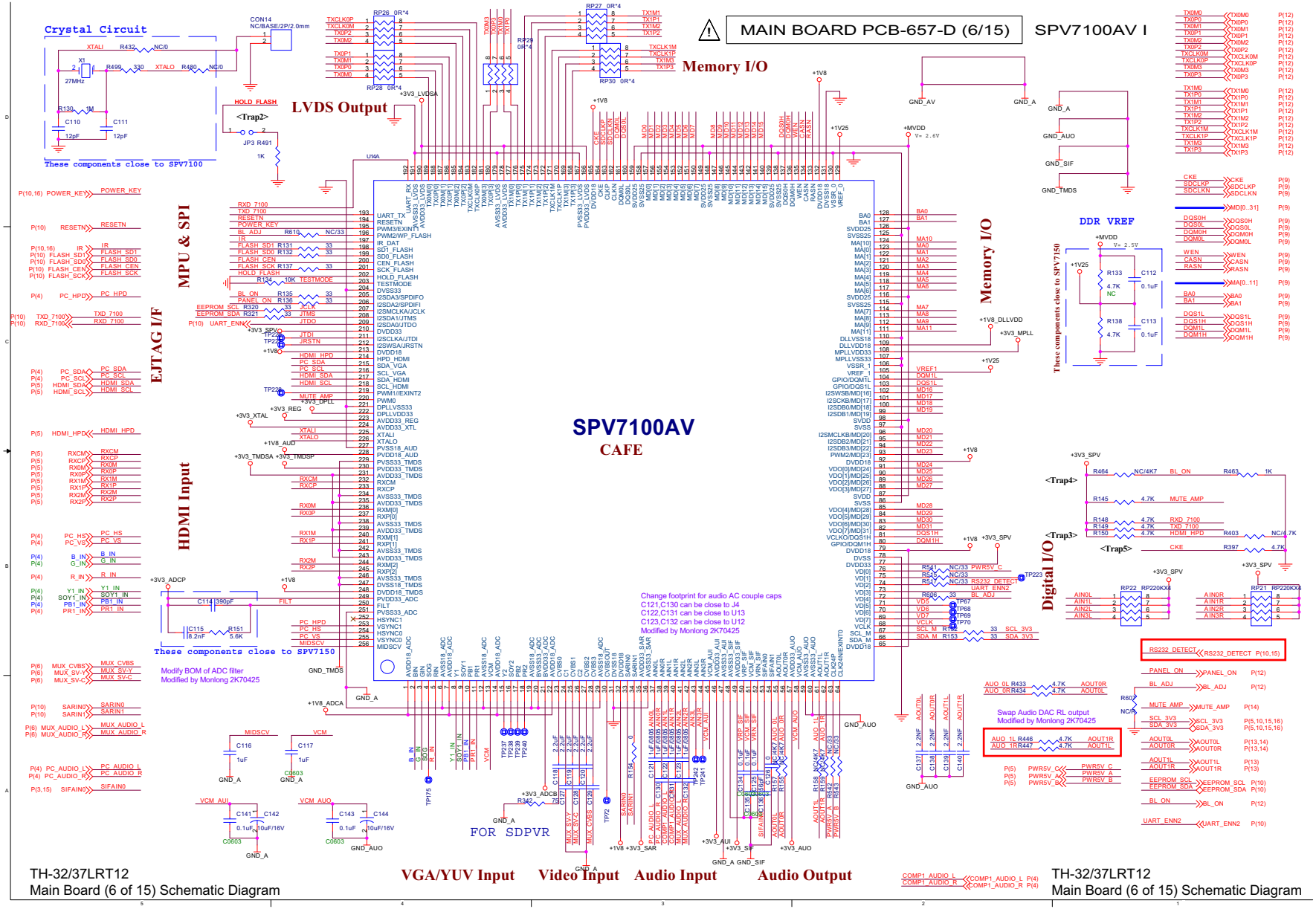


TH-32/37LRT12
Main Board (4 of 15) Schematic Diagram

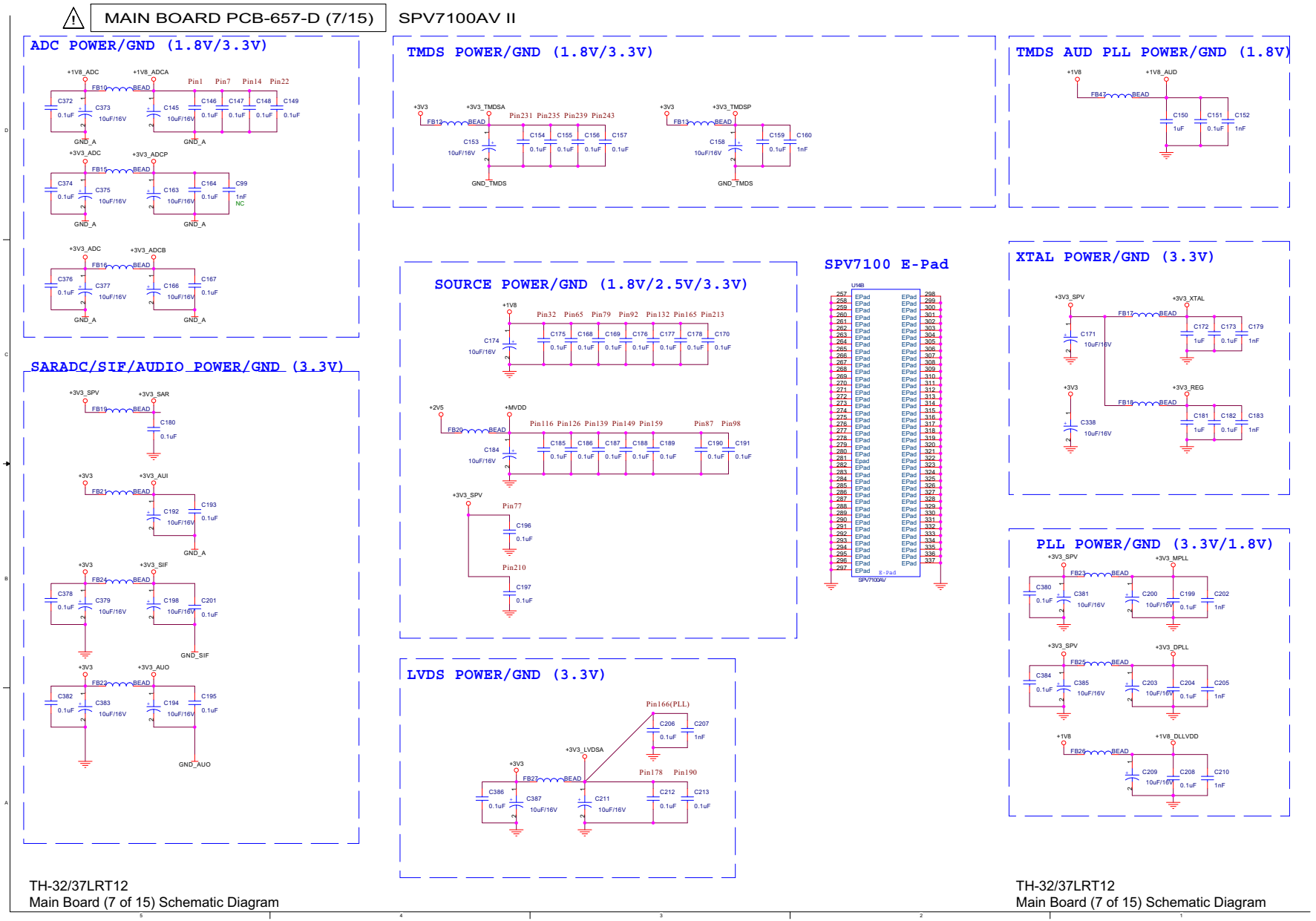
12.6. Main Board (5 of 15) Schematic Diagram


MAIN BOARD PCB-657-D (5/15)
M52790FP
5V I2C CONTROLLER SIGNALS
These components need to close to SPV7100
Use one pi filter for AV Mux CVBS Output
Modified by Monlong 2K70425
L14 belongs to 0ohm
C341,C344 belong to N.C
Use one pi filter for AV Mux SV-Y Output
Modified by Monlong 2K70425
L18 : 1.8UH --> 0ohm
C346,C347 : 220PF --> NC
Add the voltage divider for audio input signals
Modified by Monlong 2K70425
TH-32/37LRT12
Main Board (5 of 15) Schematic Diagram

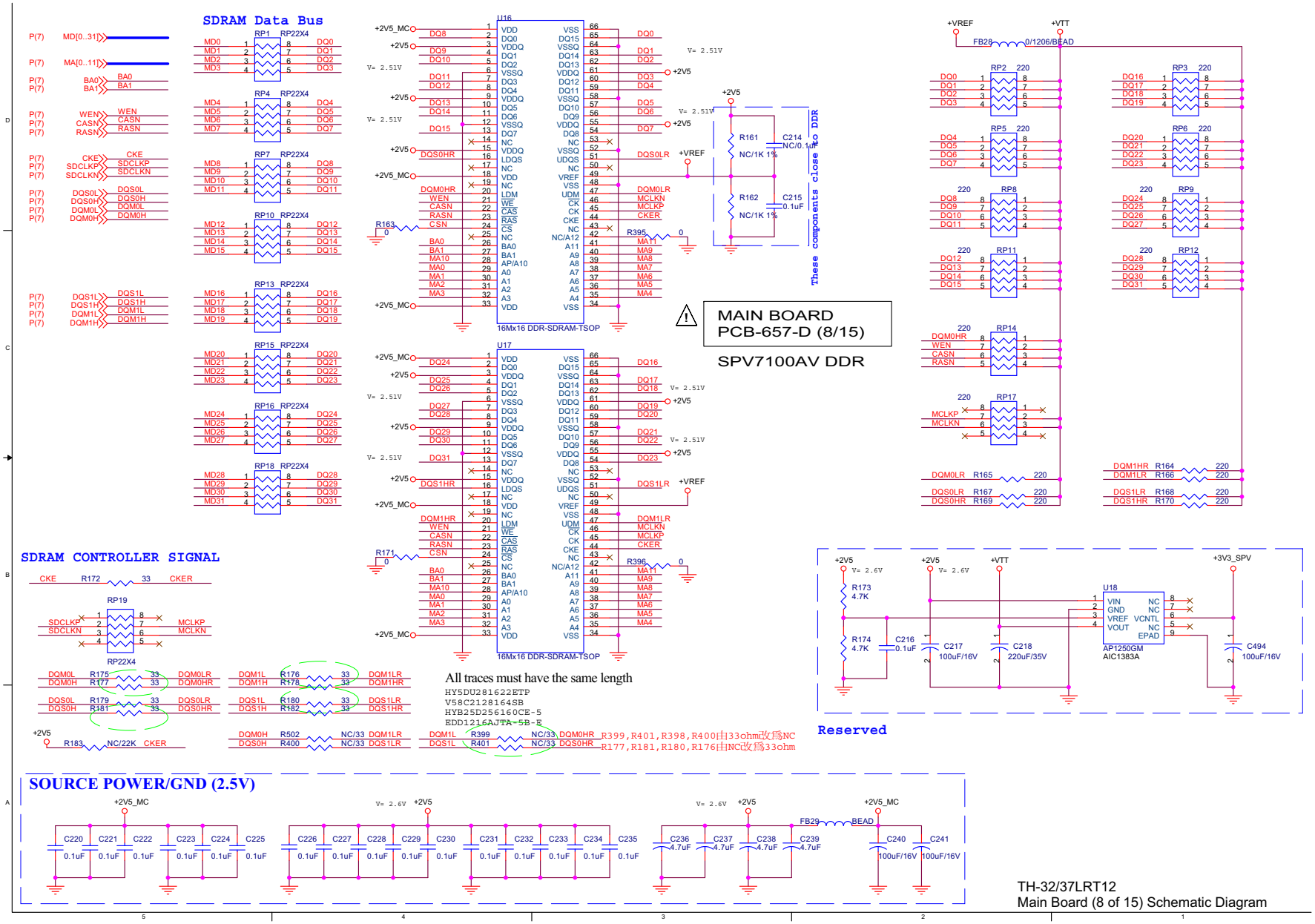
12.7. Main Board (6 of 15) Schematic Diagram



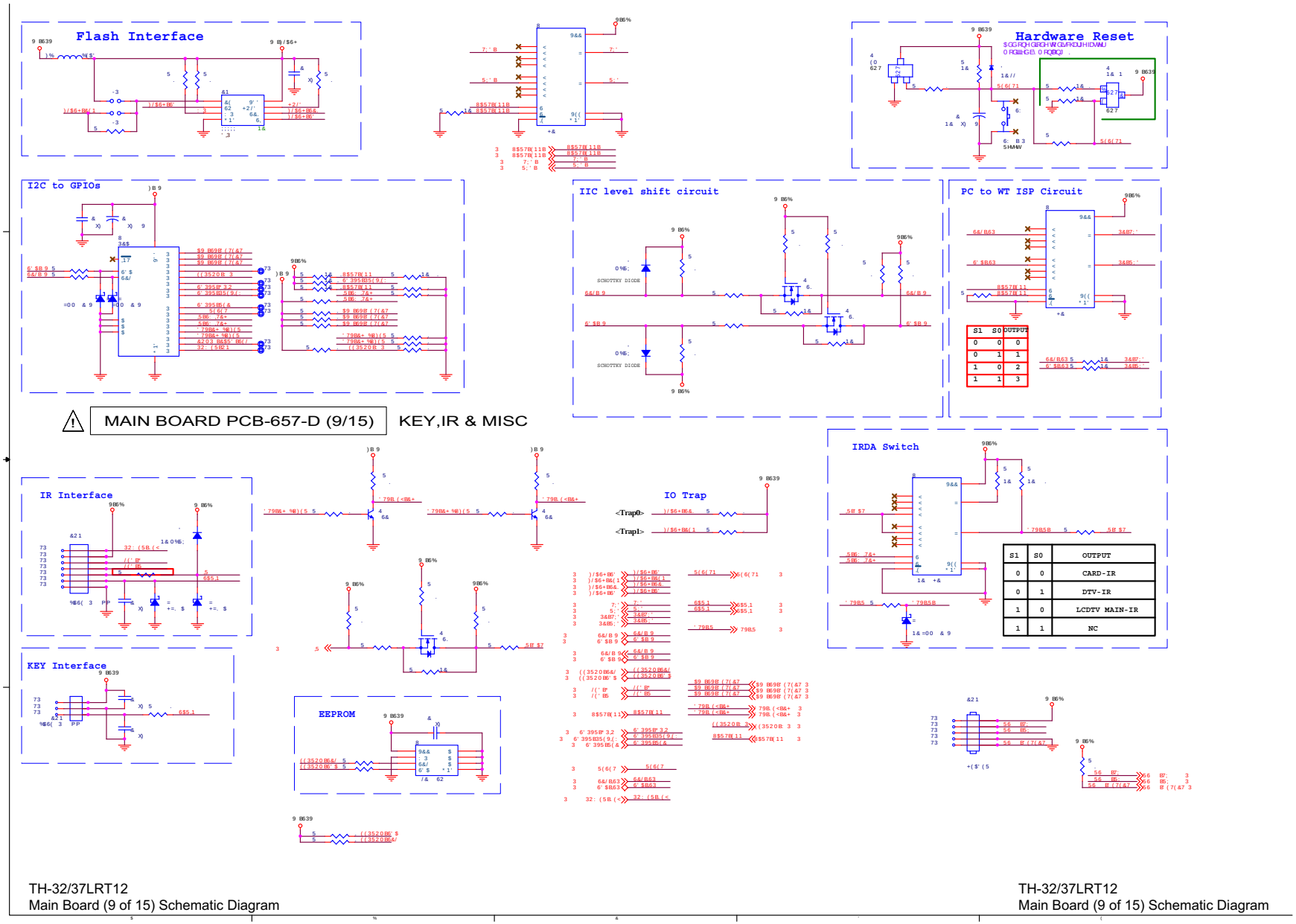
12.8. Main Board (7 of 15) Schematic Diagram



12.9. Main Board (8 of 15) Schematic Diagram

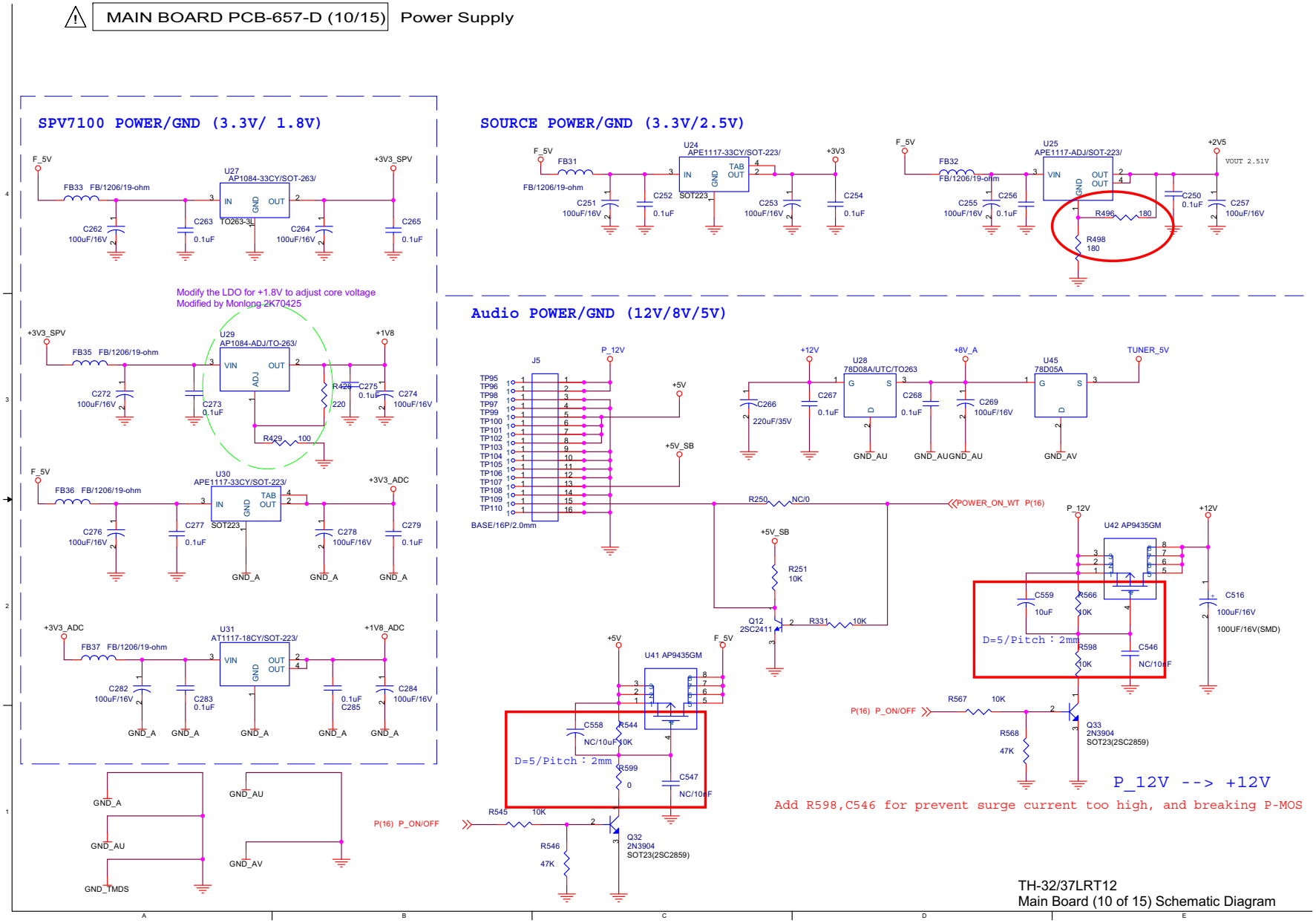


12.10. Main Board (9 of 15) Schematic Diagram

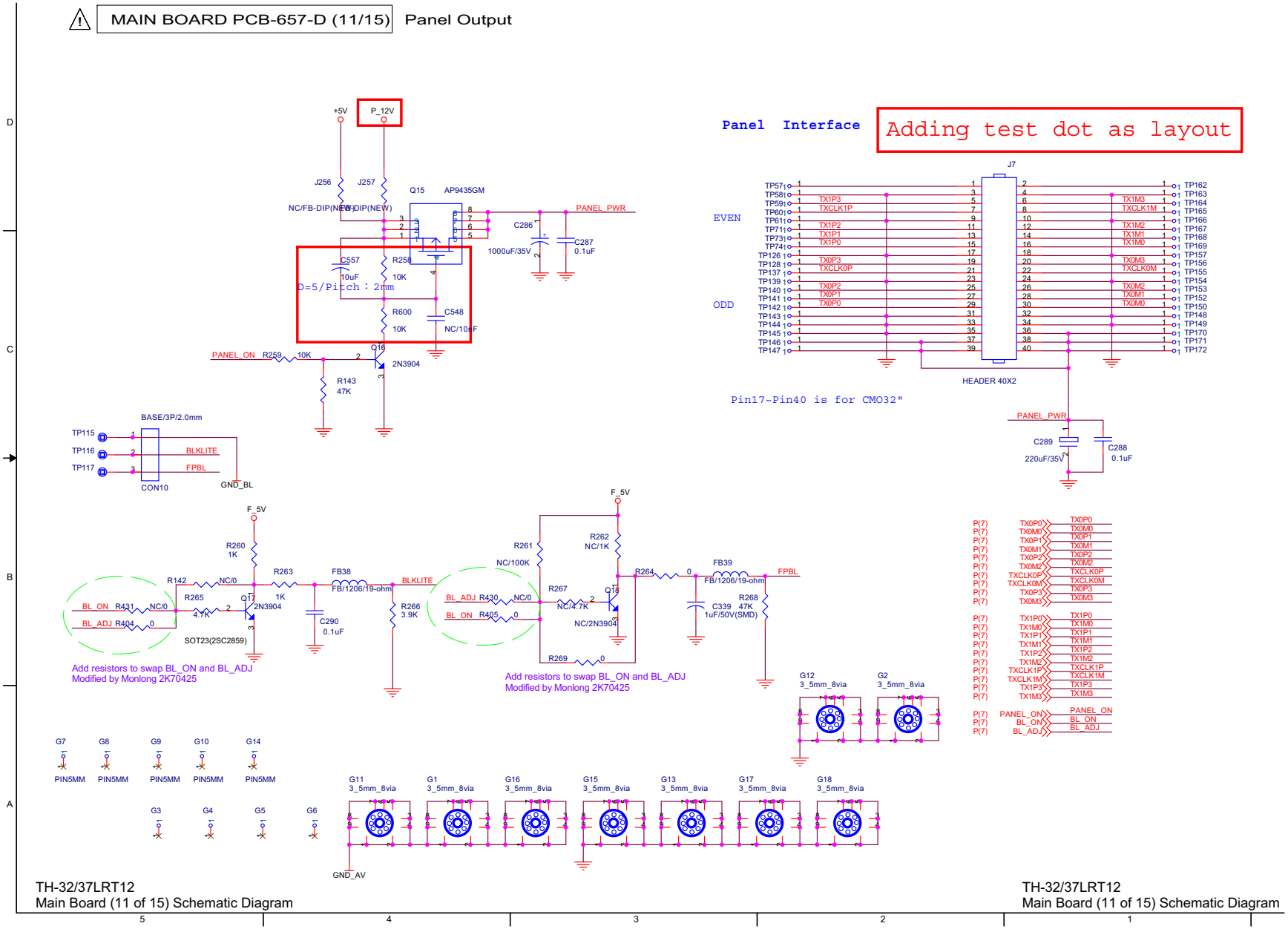


TH-32/37LRT12
Main Board (9 of 15) Schematic Diagram

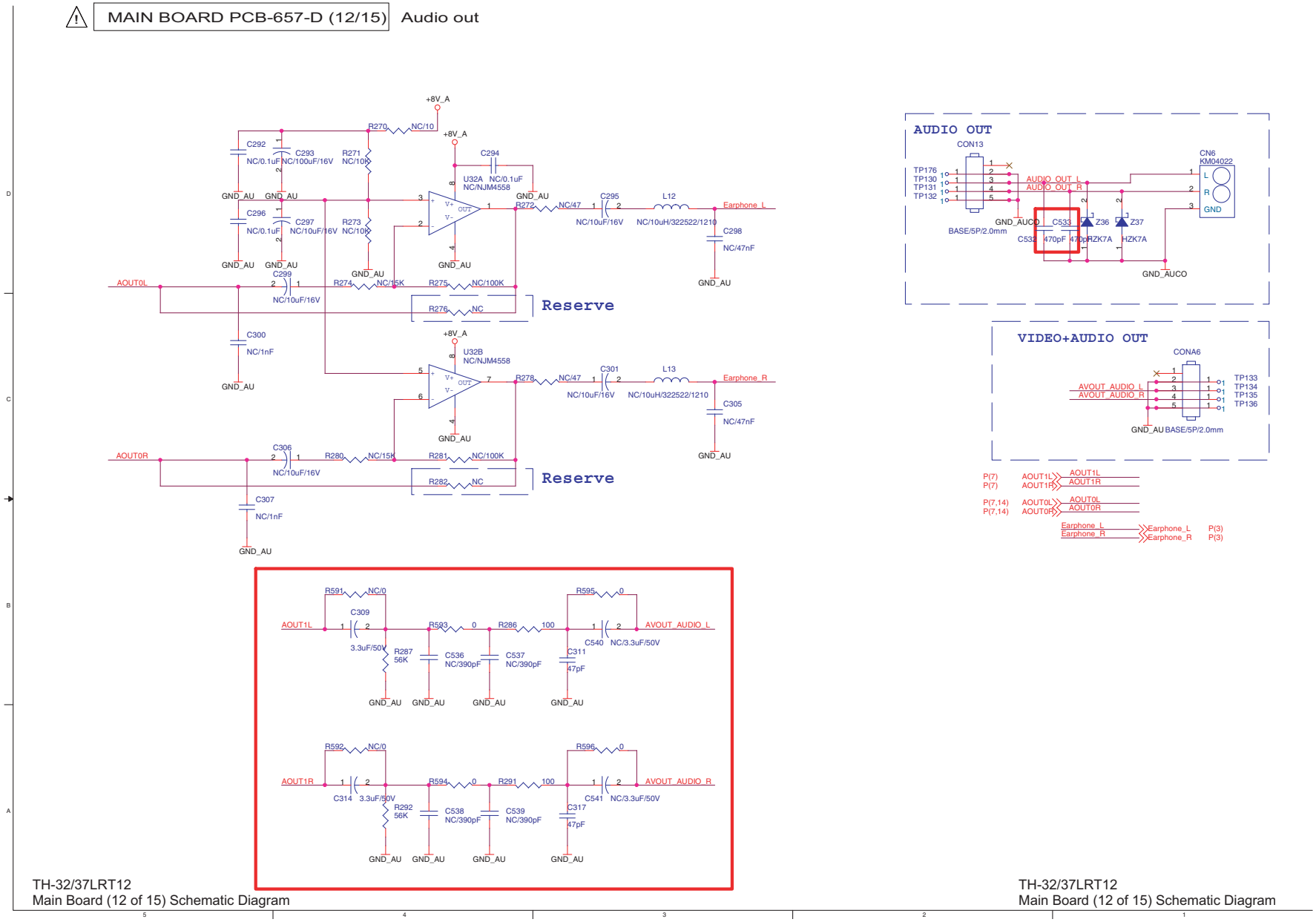
12.11. Main Board (10 of 15) Schematic Diagram


MAIN BOARD PCB-657-D (10/15)
Power Supply
SPV7100 POWER/GND (3.3V/ 1.8V)
SOURCE POWER/GND (3.3V/2.5V)
Audio POWER/GND (12V/8V/5V)
Modify the LDO for +1.8V to adjust core voltage
Modified by Monlong 2K70425
P_12V --> +12V
Add R598,C546 for prevent surge current too high, and breaking P-MOS
TH-32/37LRT12
Main Board (10 of 15) Schematic Diagram

12.12. Main Board (11 of 15) Schematic Diagram

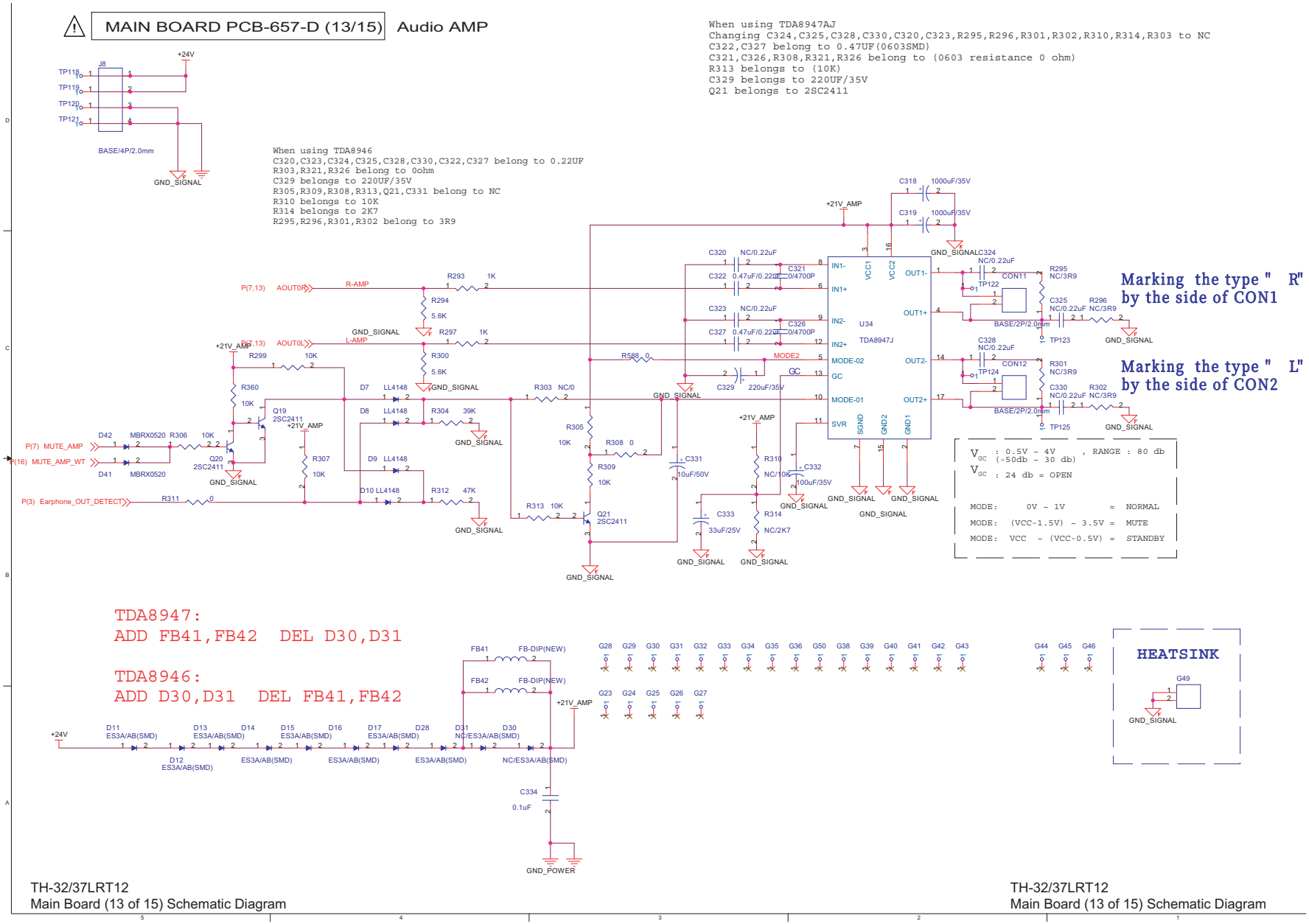


12.13. Main Board (12 of 15) Schematic Diagram

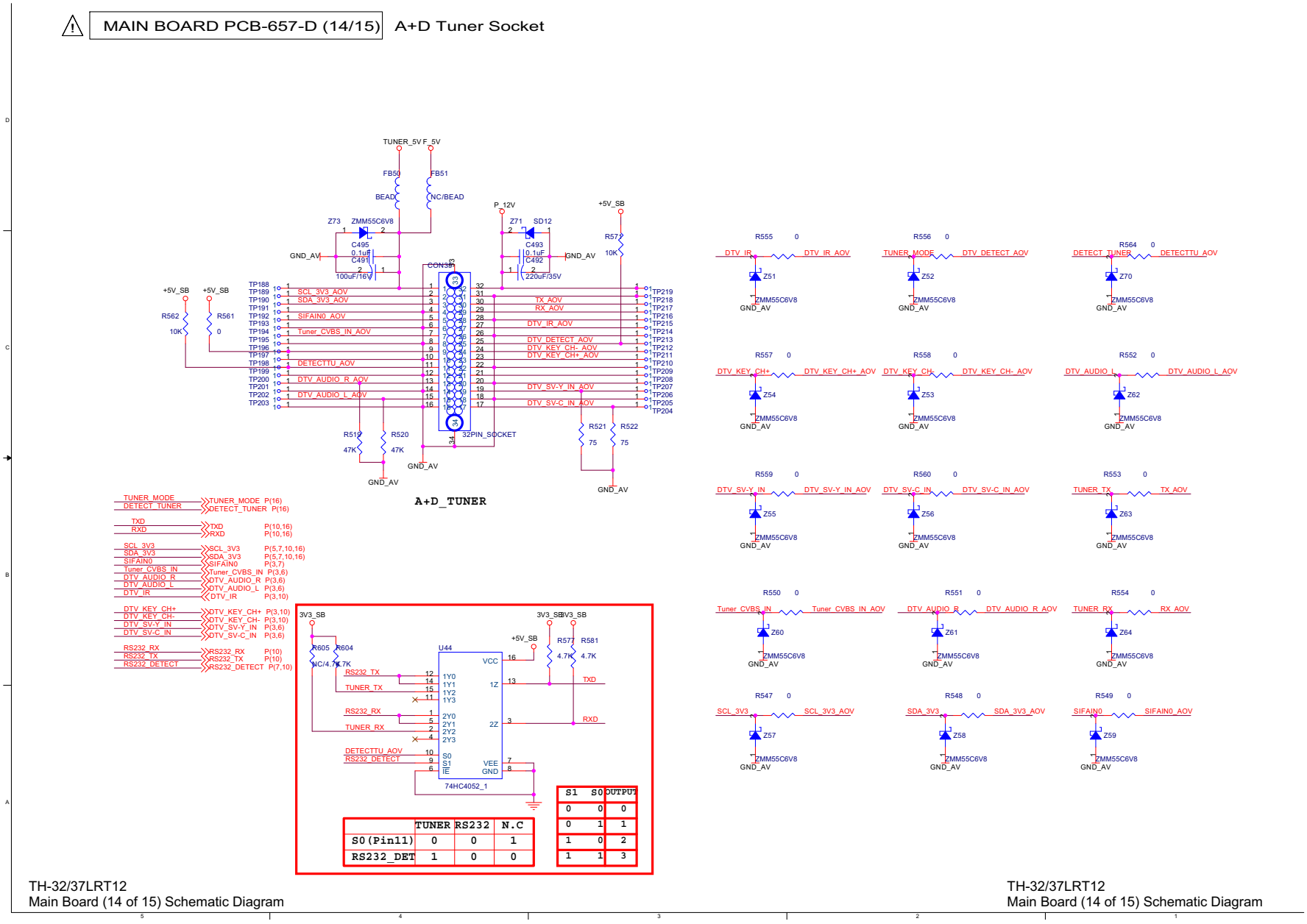


TH-32/37LRT12
Main Board (12 of 15) Schematic Diagram

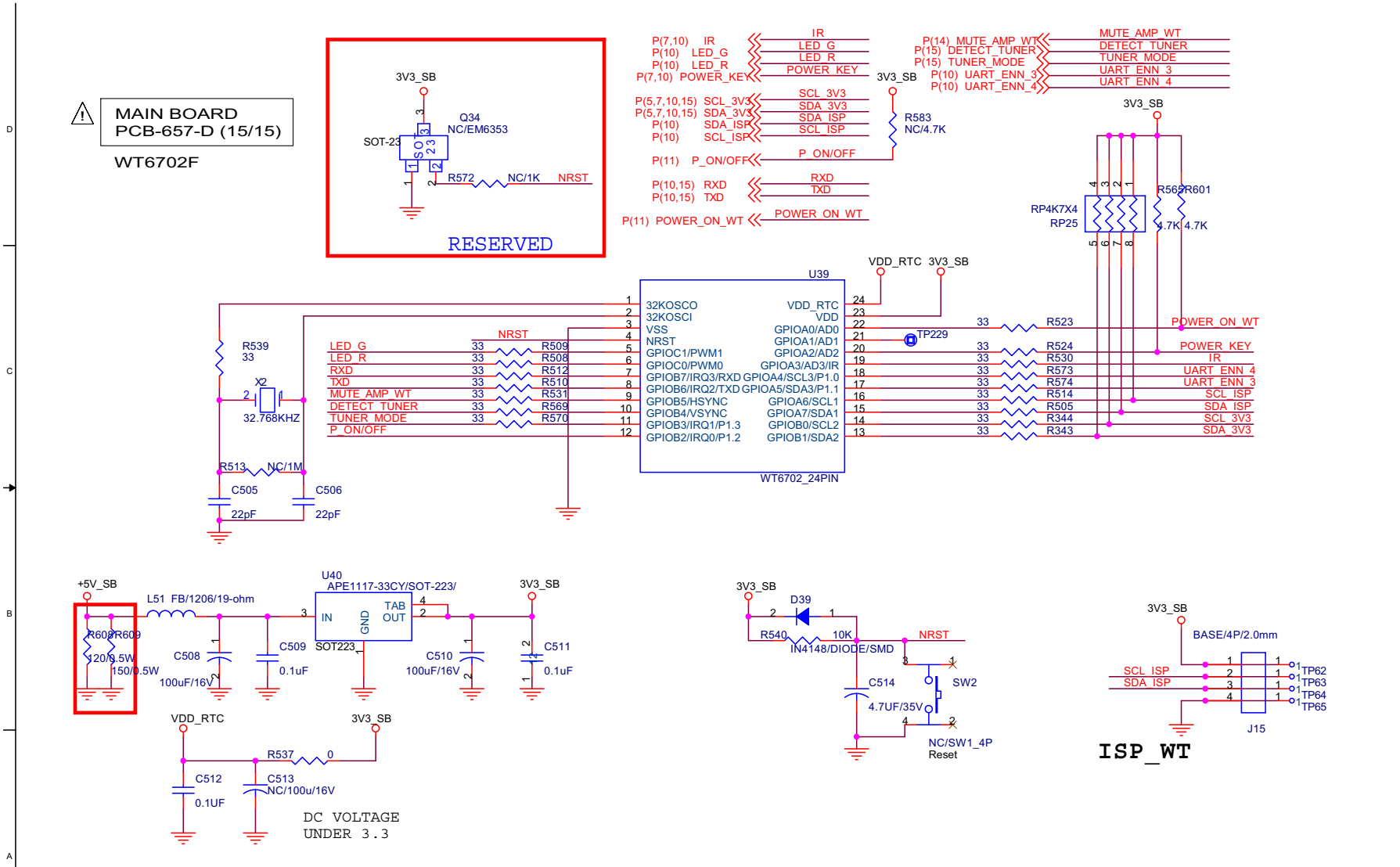
12.14. Main Board (13 of 15) Schematic Diagram


MAIN BOARD PCB-657-D (13/15) Audio AMP
When using TDA8947AJ
Changing C324,C325,C328,C330,C320,C323,R295,R296,R301,R302,R310,R314,R303 to NC
C322,C327 belong to 0.47UF(0603SMD)
C321,C326,R308,R321,R326 belong to (0603 resistance 0 ohm)
R313 belongs to (10K)
C329 belongs to 220UF/35V
Q21 belongs to 2SC2411
When using TDA8946
C320,C323,C324,C325,C328,C330,C322,C327 belong to 0.22UF
R303,R321,R326 belong to 0ohm
C329 belongs to 220UF/35V
R305,R309,R308,R313,Q21,C331 belong to NC
R310 belongs to 10K
R314 belongs to 2K7
R295,R296,R301,R302 belong to 3R9
Marking the type " R" by the side of CON1
Marking the type " L" by the side of CON2
TDA8947:
ADD FB41,FB42 DEL D30,D31
TDA8946:
ADD D30,D31 DEL FB41,FB42
HEATSINK
TH-32/37LRT12
Main Board (13 of 15) Schematic Diagram
TH-32/37LRT12
Main Board (13 of 15) Schematic Diagram

12.15. Main Board (14 of 15) Schematic Diagram

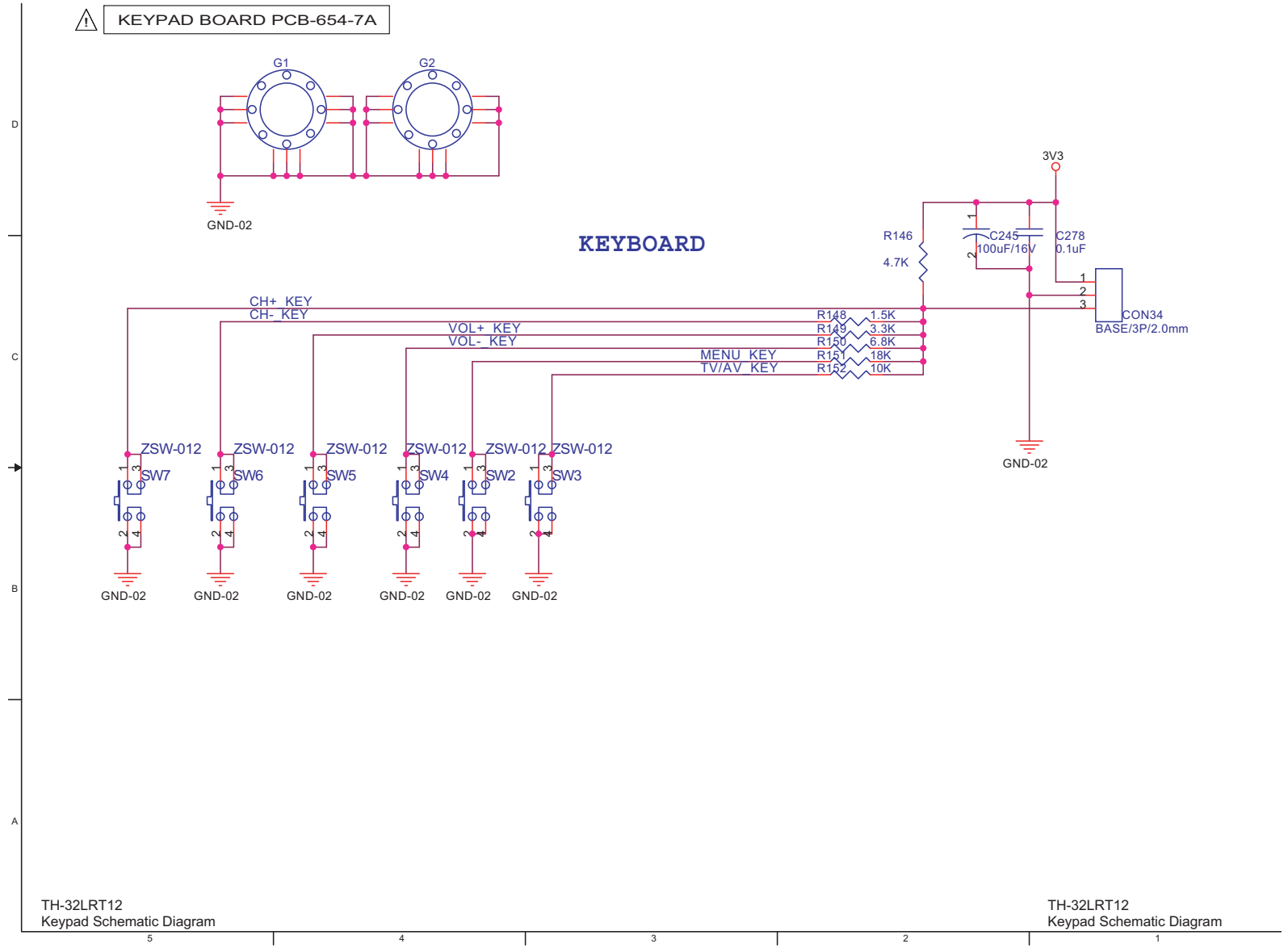


12.16. Main Board (15 of 15) Schematic Diagram

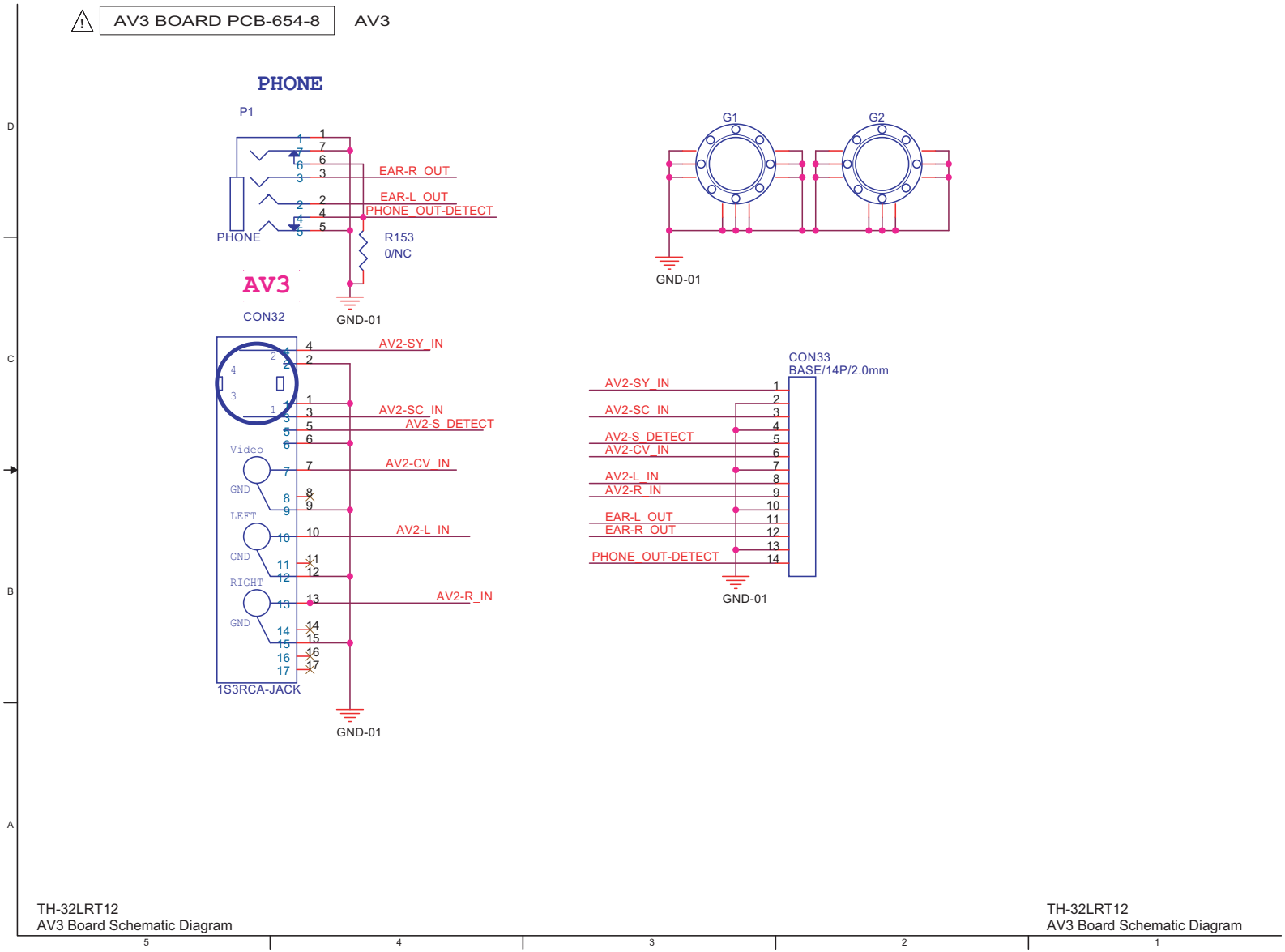


TH-32/37LRT12
Main Board (15 of 15) Schematic Diagram

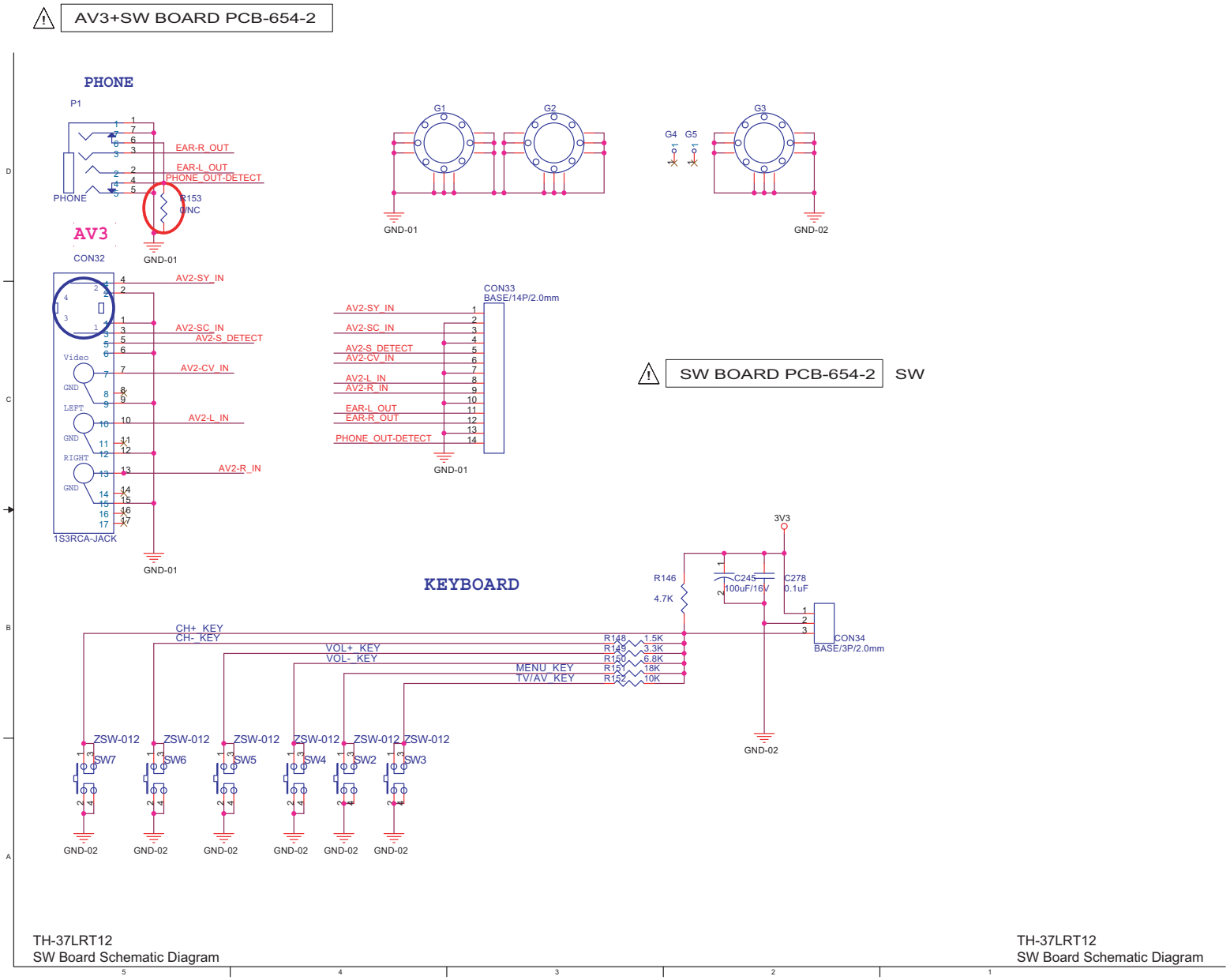
12.17. Keypad Board Schematic Diagram (TH-32LRT12U-A)



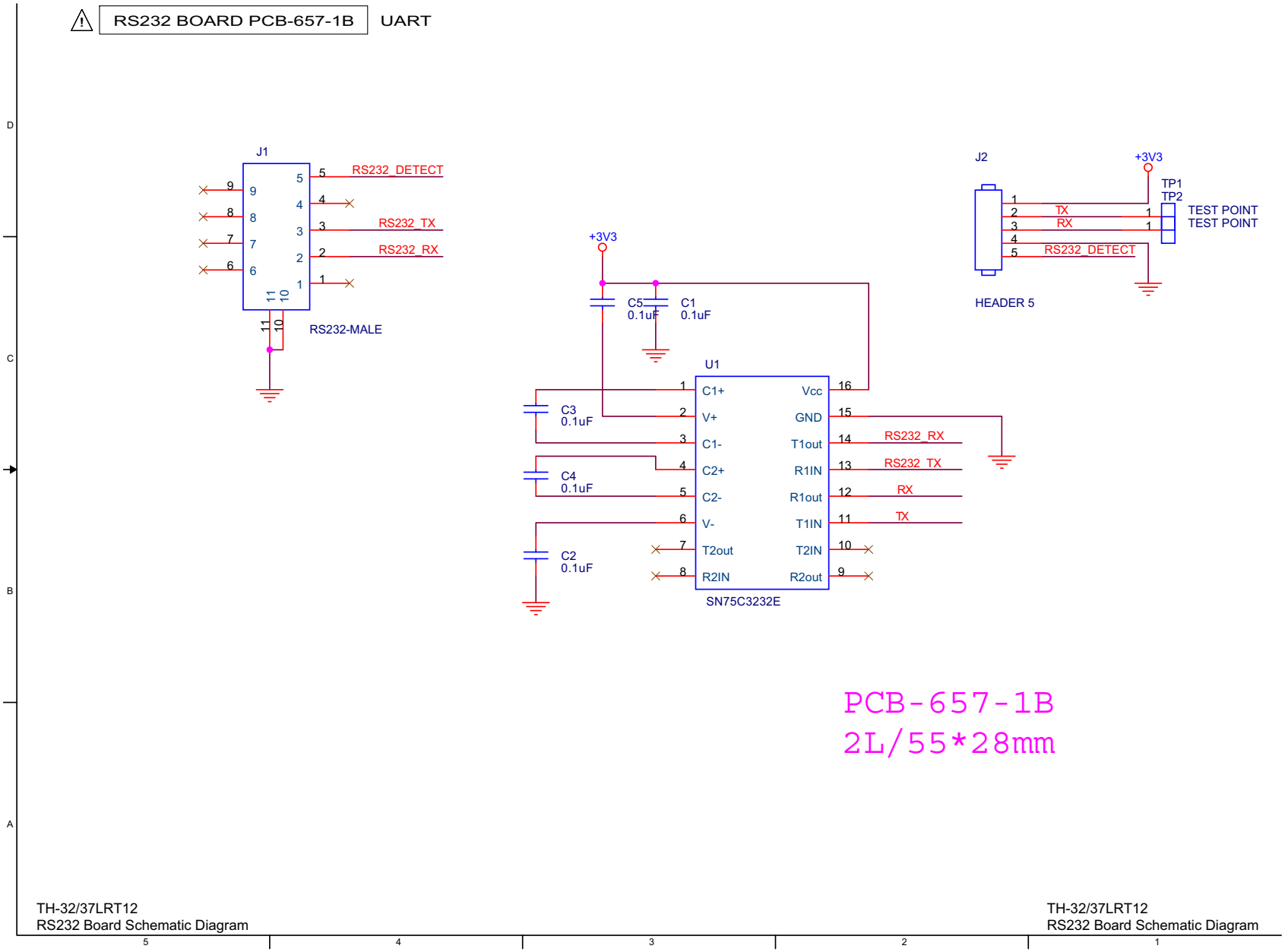
12.18. AV3 Board Schematic Diagram (TH-32LRT12U-A)



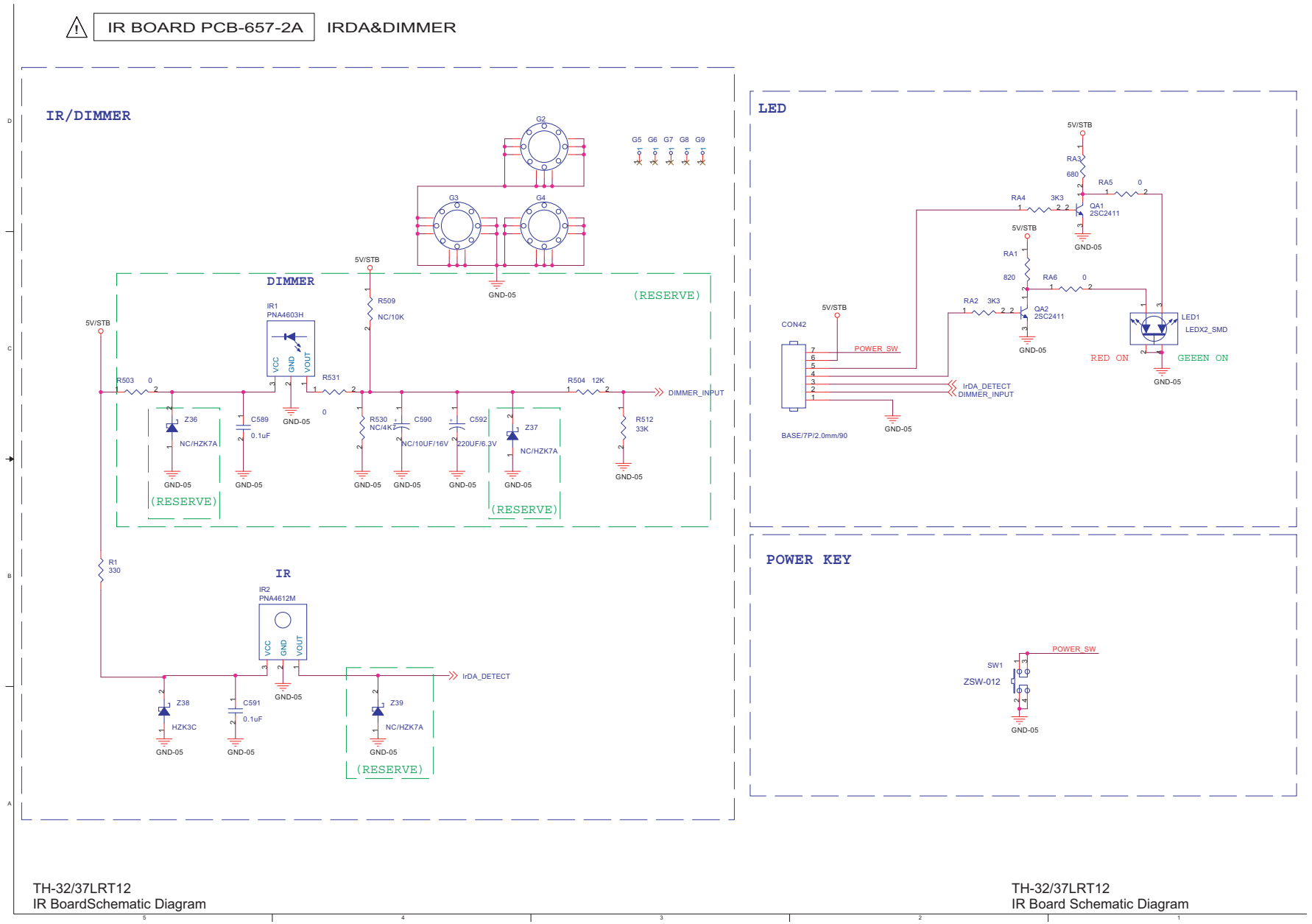
12.19. AV3+SW Board Schematic Diagram (TH-37LRT12U/M/A)



12.20. RS232 Board Schematic Diagram



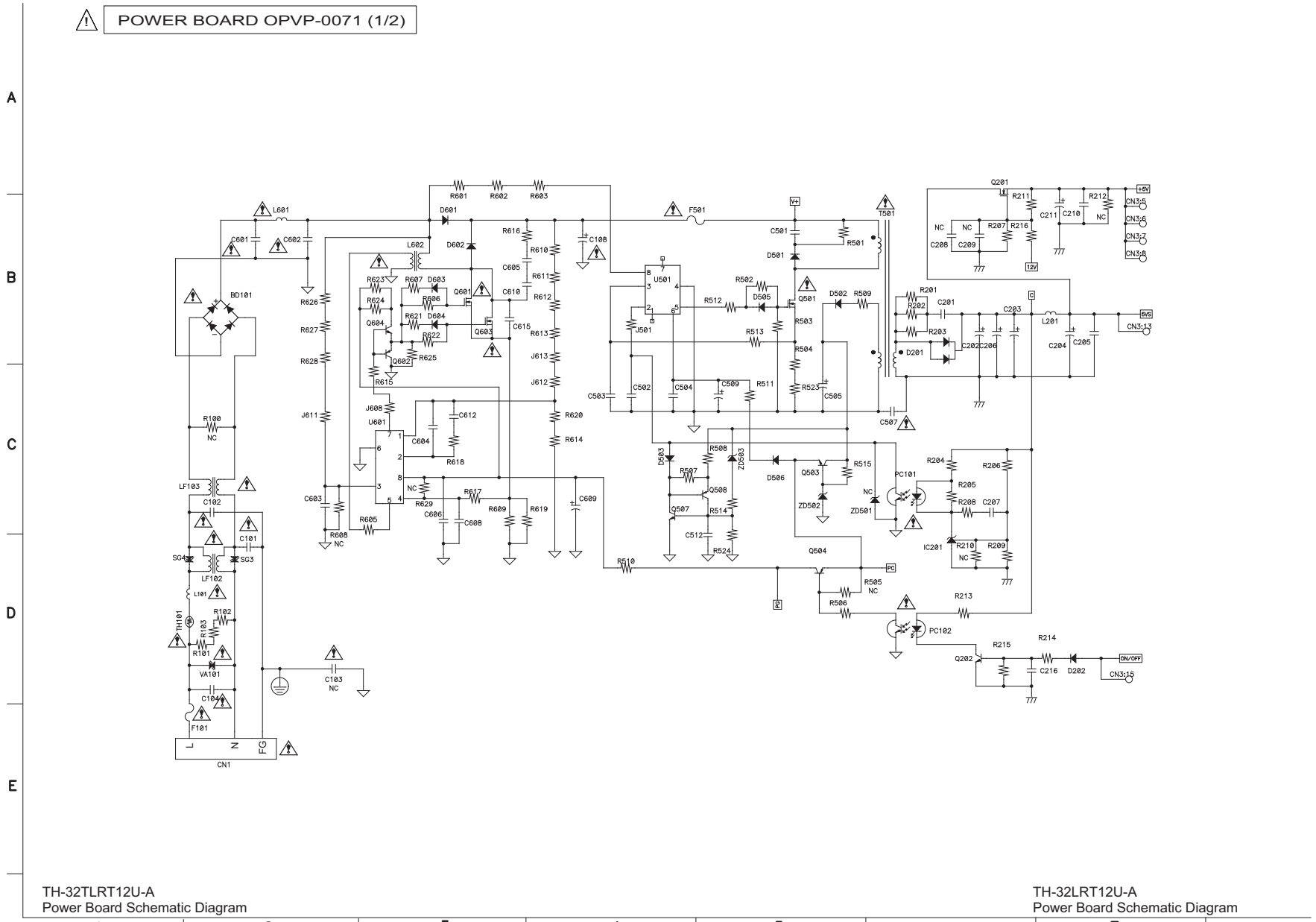
12.21. IR Board Schematic Diagram



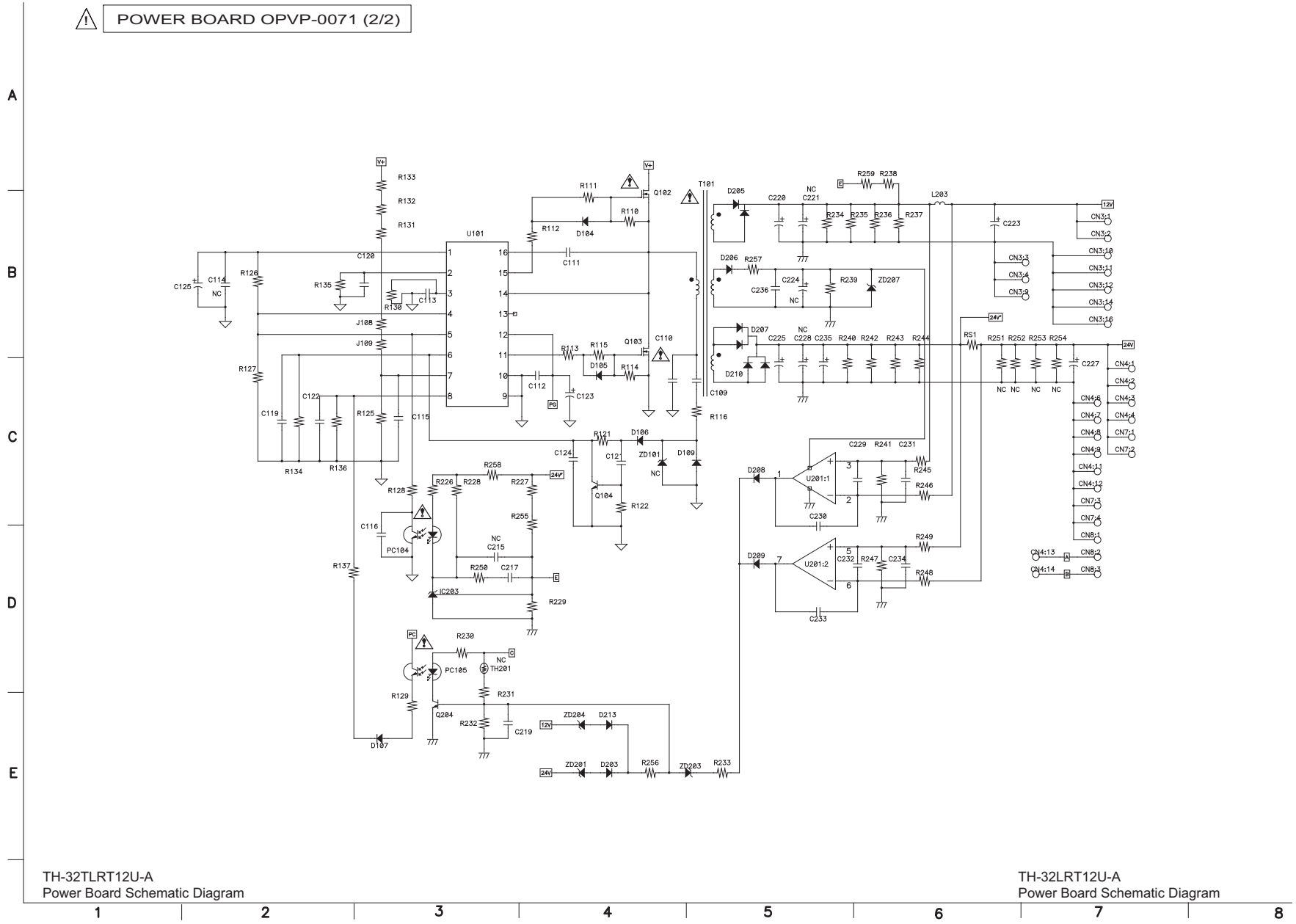
TH-32/37LRT12
IR BoardSchematic Diagram

TH-32/37LRT12
IR Board Schematic Diagram

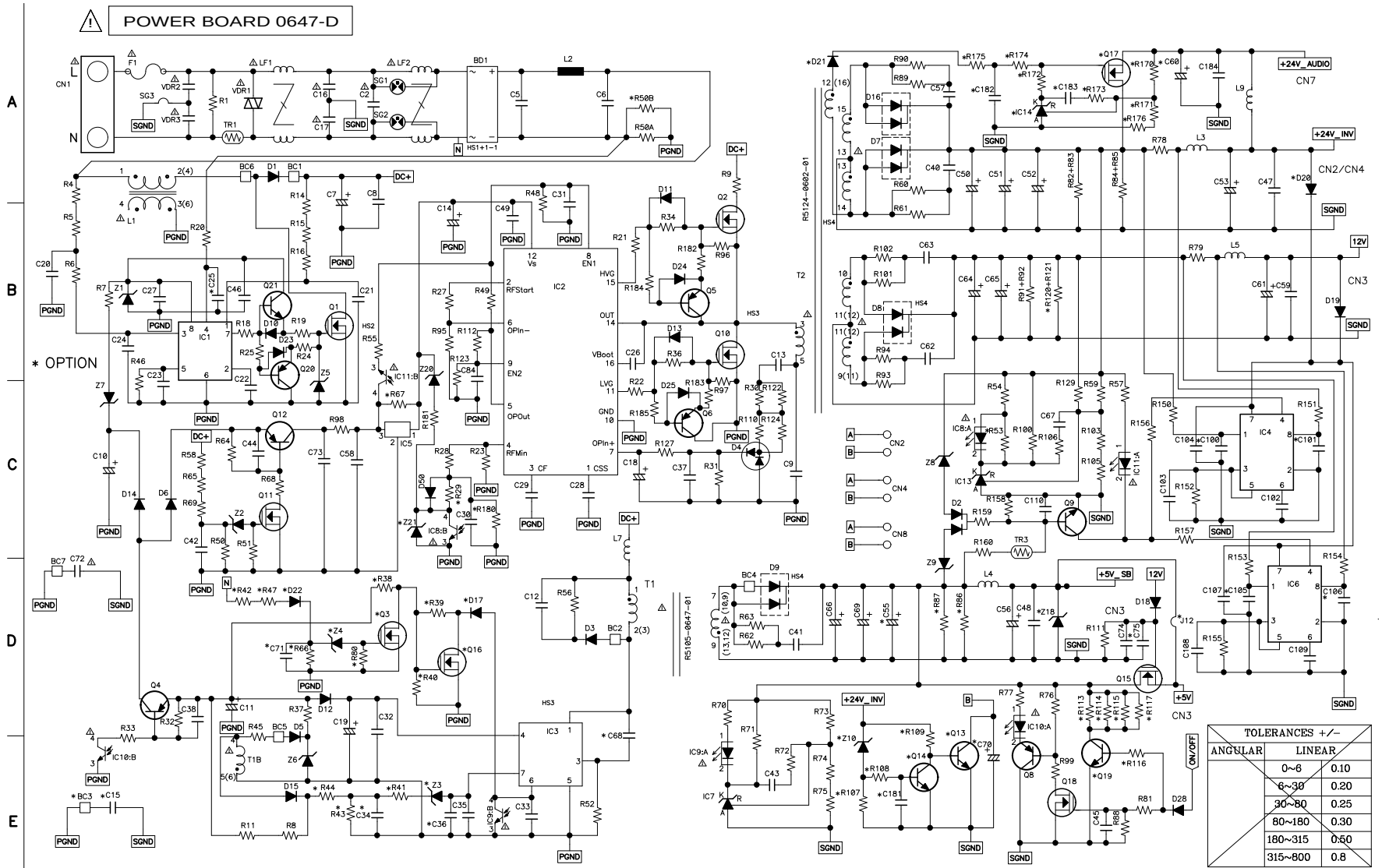
12.22. Power Board Schematic Diagram (1/2) (for TH-32LRT12U-A)



12.23. Power Board Schematic Diagram (2/2) (for TH-32LRT12U-A)



12.24. Power Board Schematic Diagram (for TH-37LRT12U/M/A)

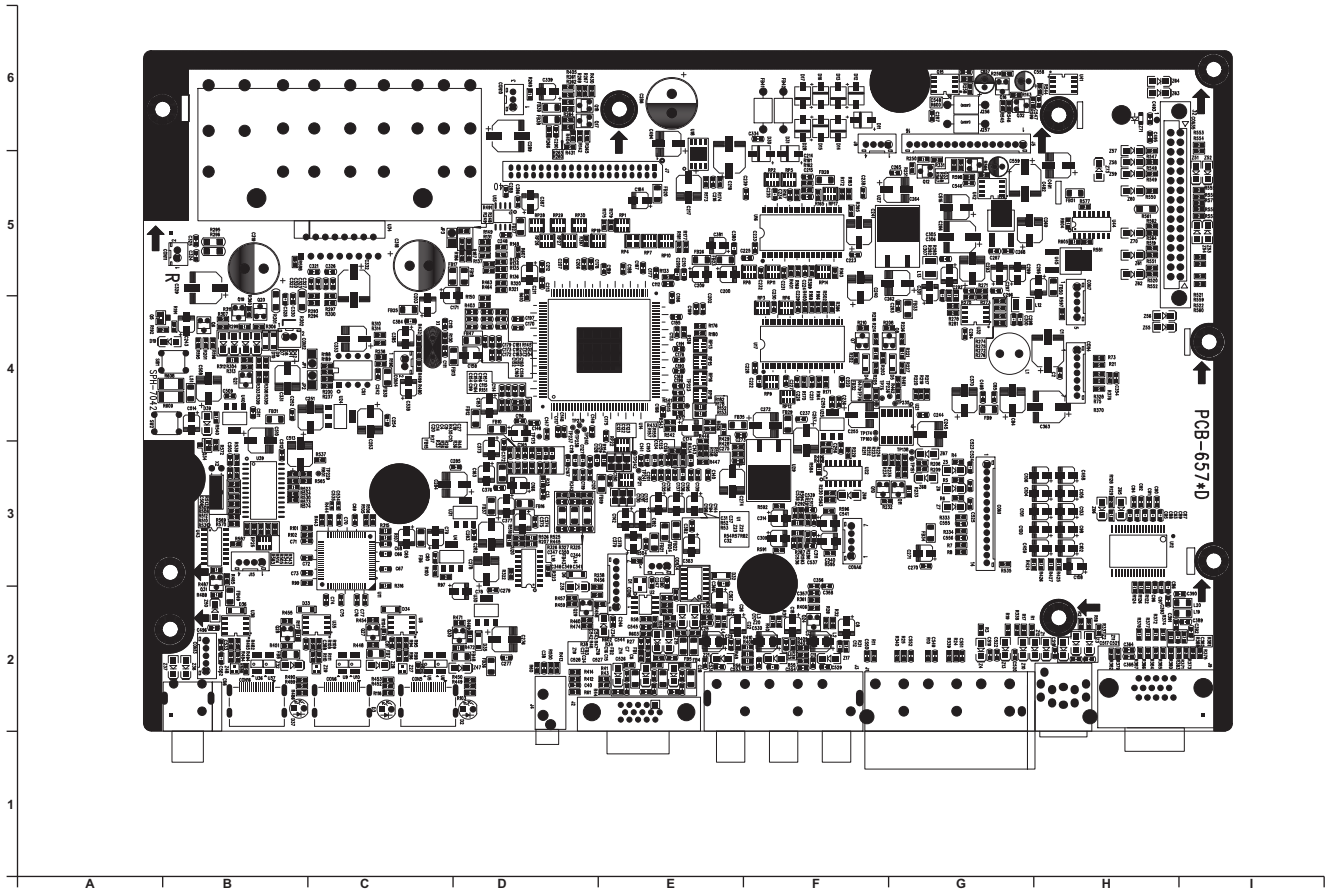


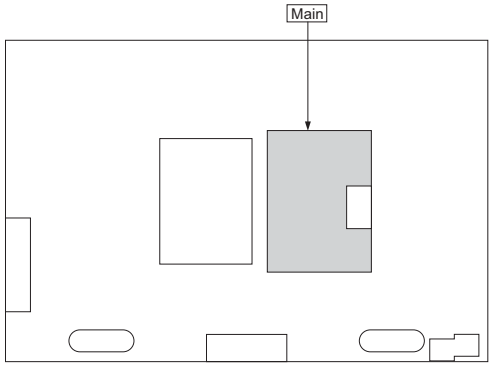
TH-37LRT12U/M/A
Power Board Schematic Diagram

TH- 37LRT12U/M/A
Power Board Schematic Diagram

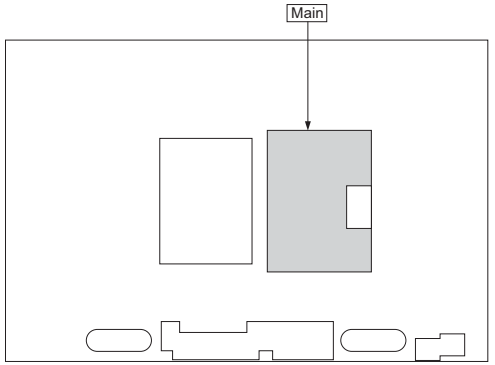
13 Printed Circuit Board

13.1. Main PCB (Component Side)



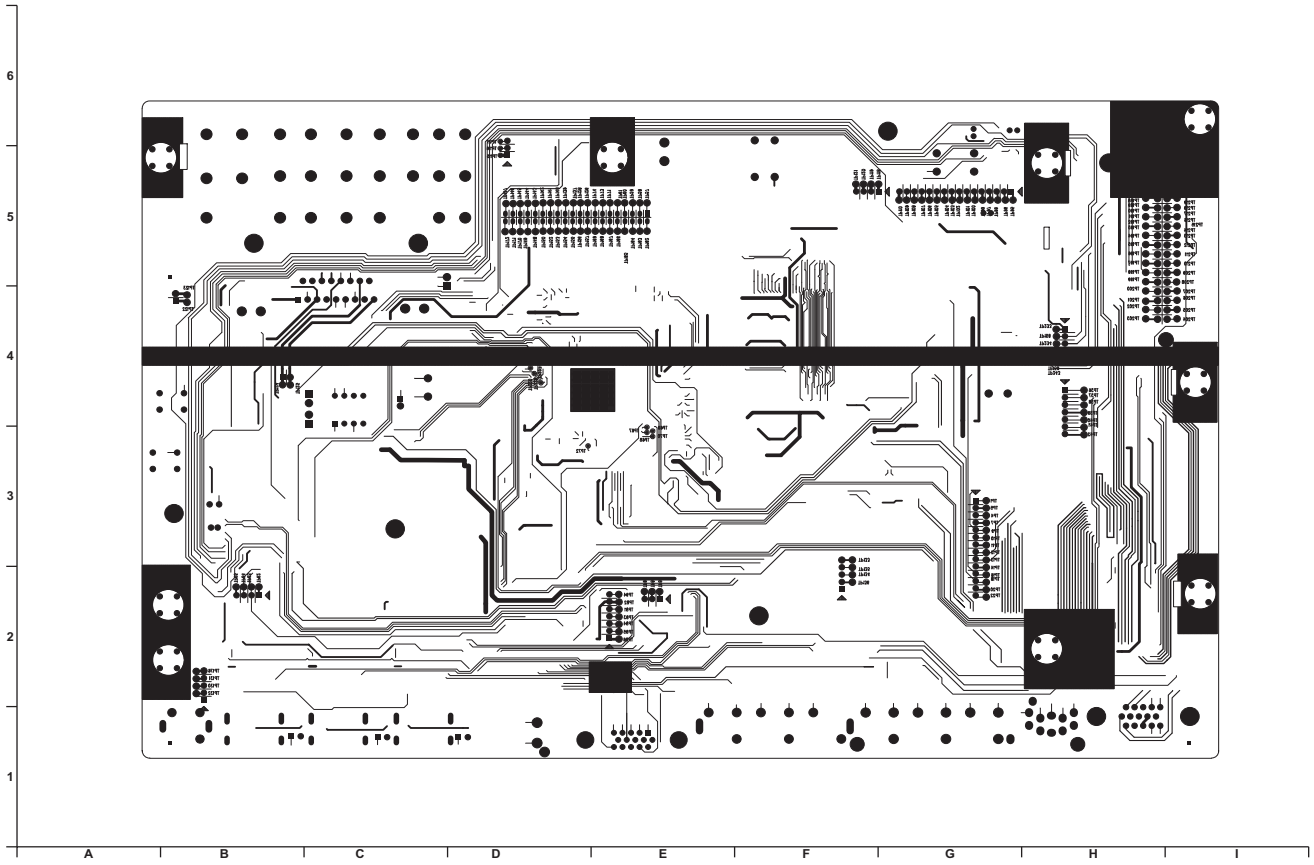


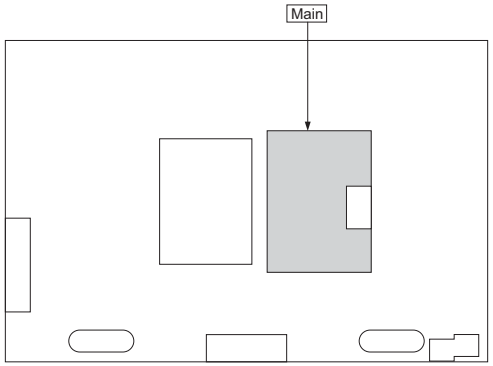
Main Board (TH-32LRT12U-A)



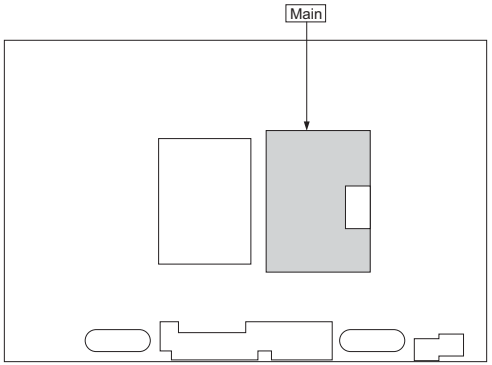
Main Board (TH-37LRT12U/M/A)

13.2. Main Board (Foil Side)



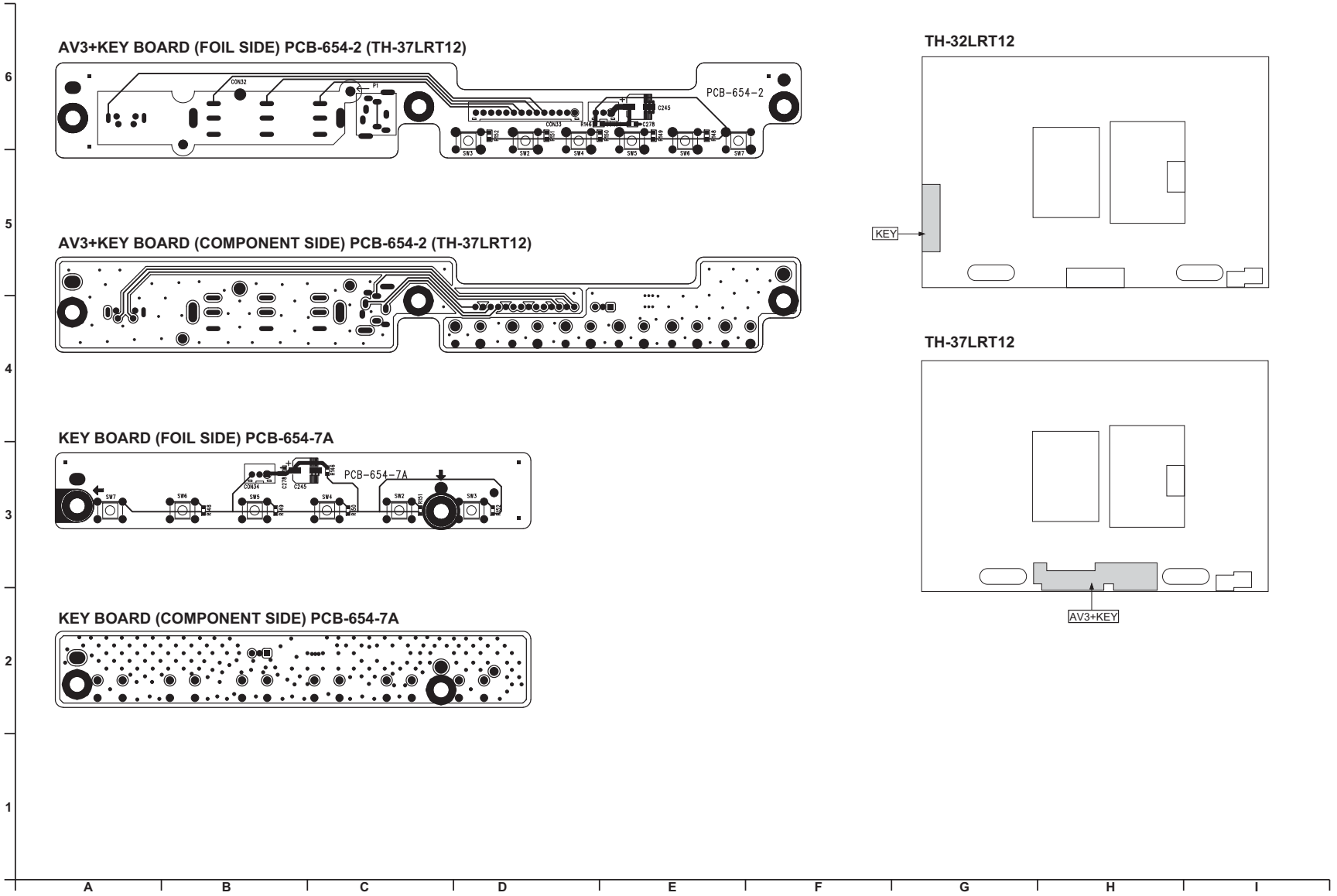


Main Board (TH-32LRT12U-A)



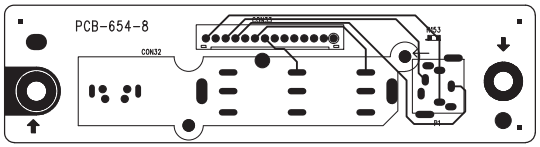
Main Board (TH-37LRT12U/M/A)

13.3. AV3+SW and Keypad Board

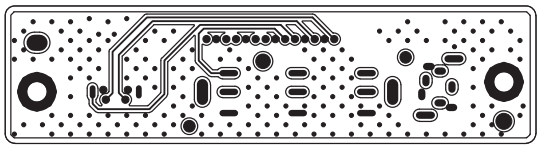


13.4. AV3, IR, and RS232 Board

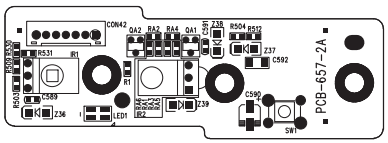
AV3 BOARD (FOIL SIDE) PCB-654-8 (TH-32LRT12)



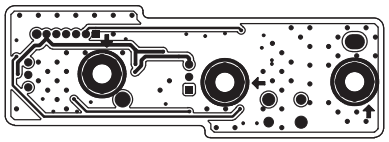
AV3 BOARD (COMPONENT SIDE) PCB-654-8 (TH-32LRT12)



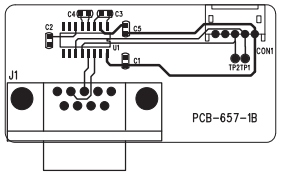
IR BOARD (FOIL SIDE) PCB-657-2A



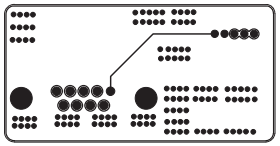
IR BOARD (COMPONENT SIDE) PCB-657-2A



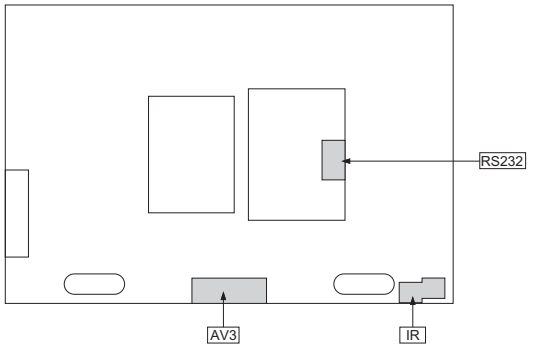
RS232 BOARD (FOIL SIDE)
PCB-657-1B



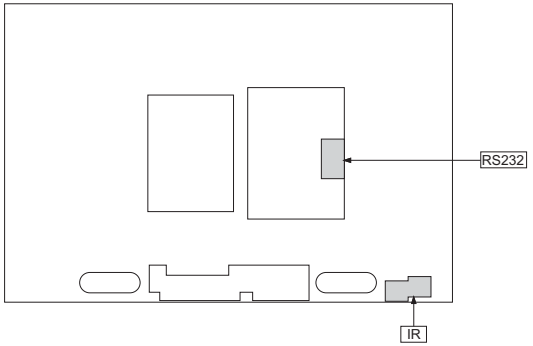
RS232 BOARD (COMPONENT SIDE)
PCB-657-1B



TH-32LRT12

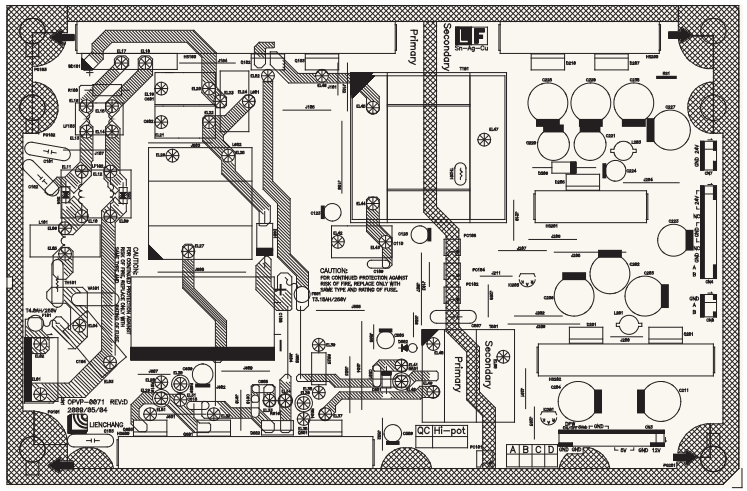


TH-37LRT12

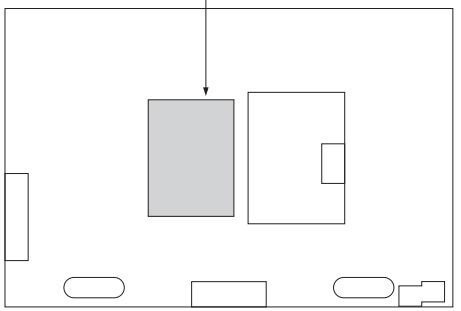


13.5. Power Board (Top Side)

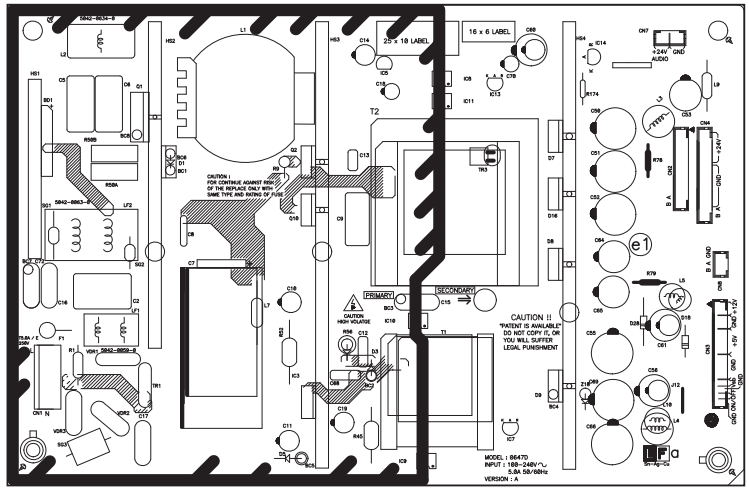
Power Board for TH-32LRT12U-A



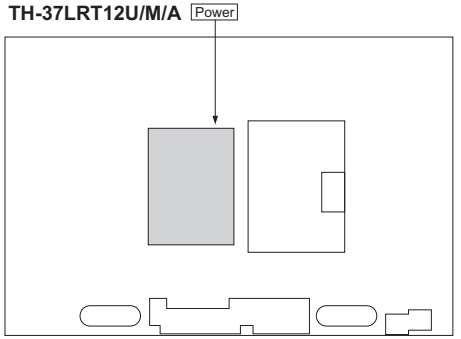
TH-32LRT12U-A Power



Power Board for TH-37LRT12U/M/A

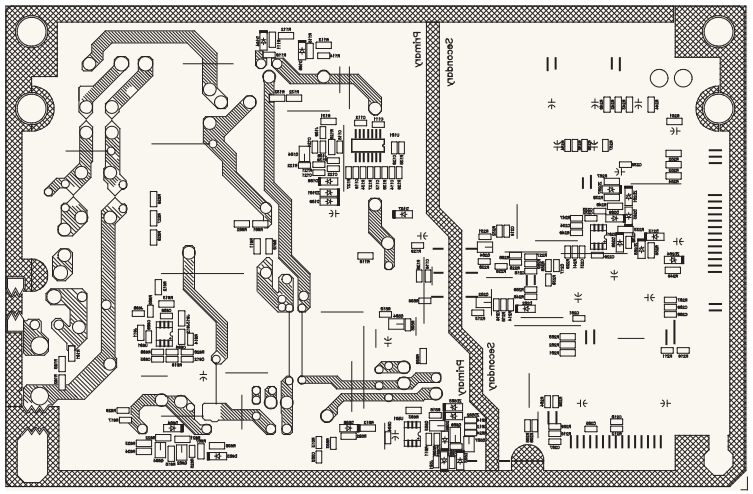


TH-37LRT12U/M/A Power

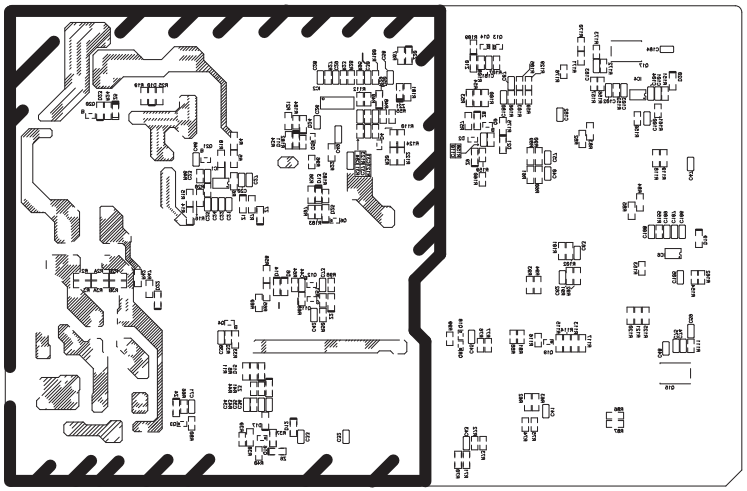


13.6. Power Board (Bottom Side)

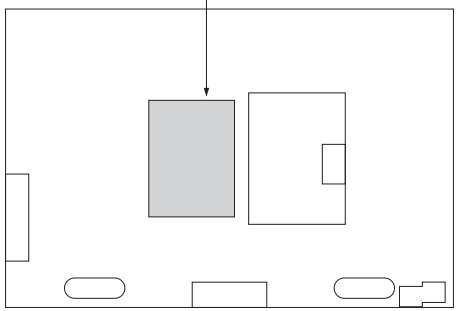
Power Board for TH-32LRT12U-A



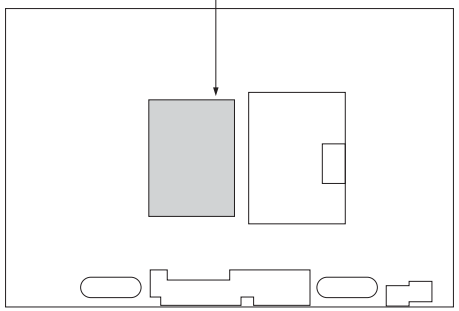
Power Board for TH-37LRT12U/M/A



TH-32LRT12U-A Power



TH-37LRT12U/M/A Power

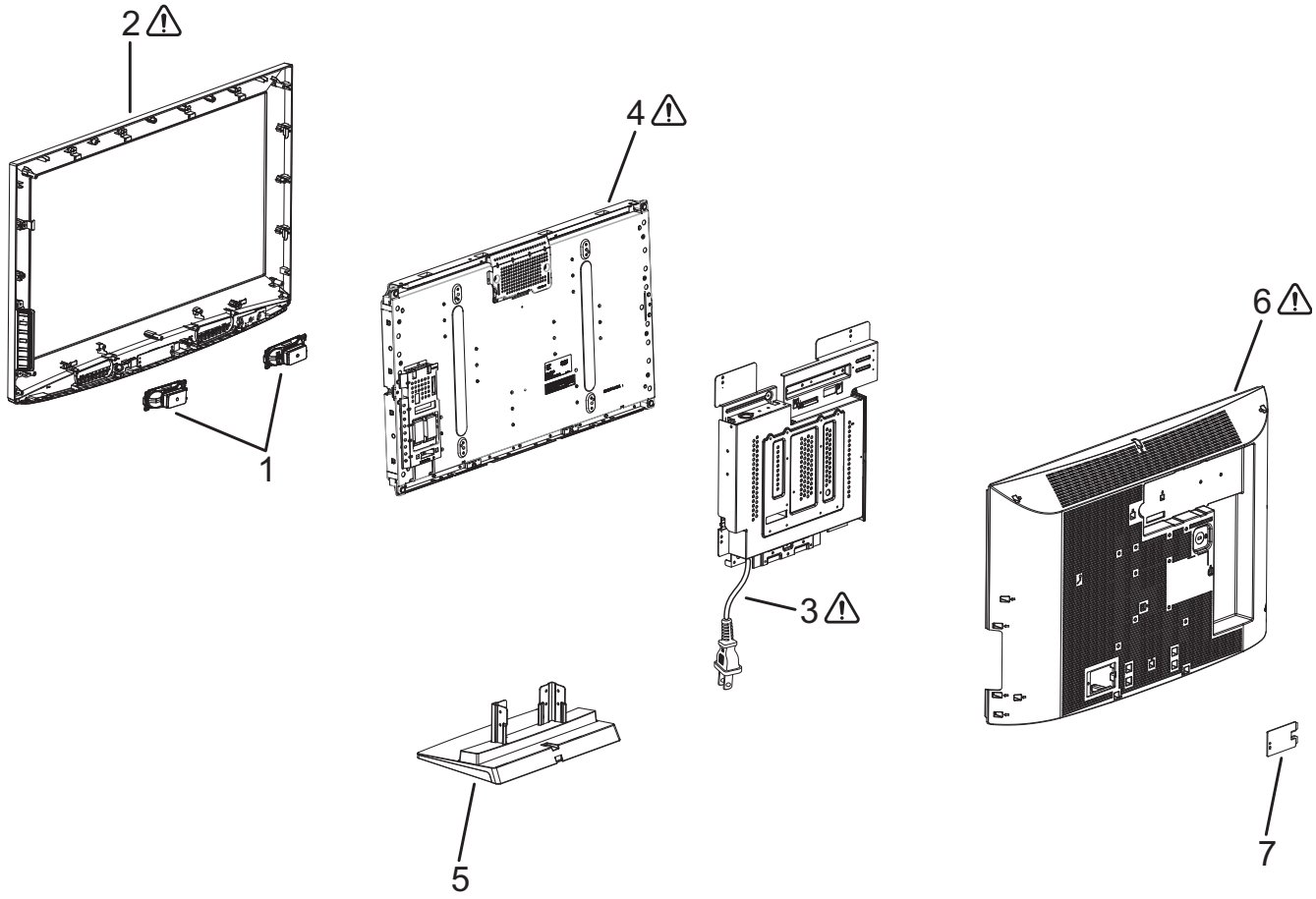


14 Exploded View and Replacement Parts List

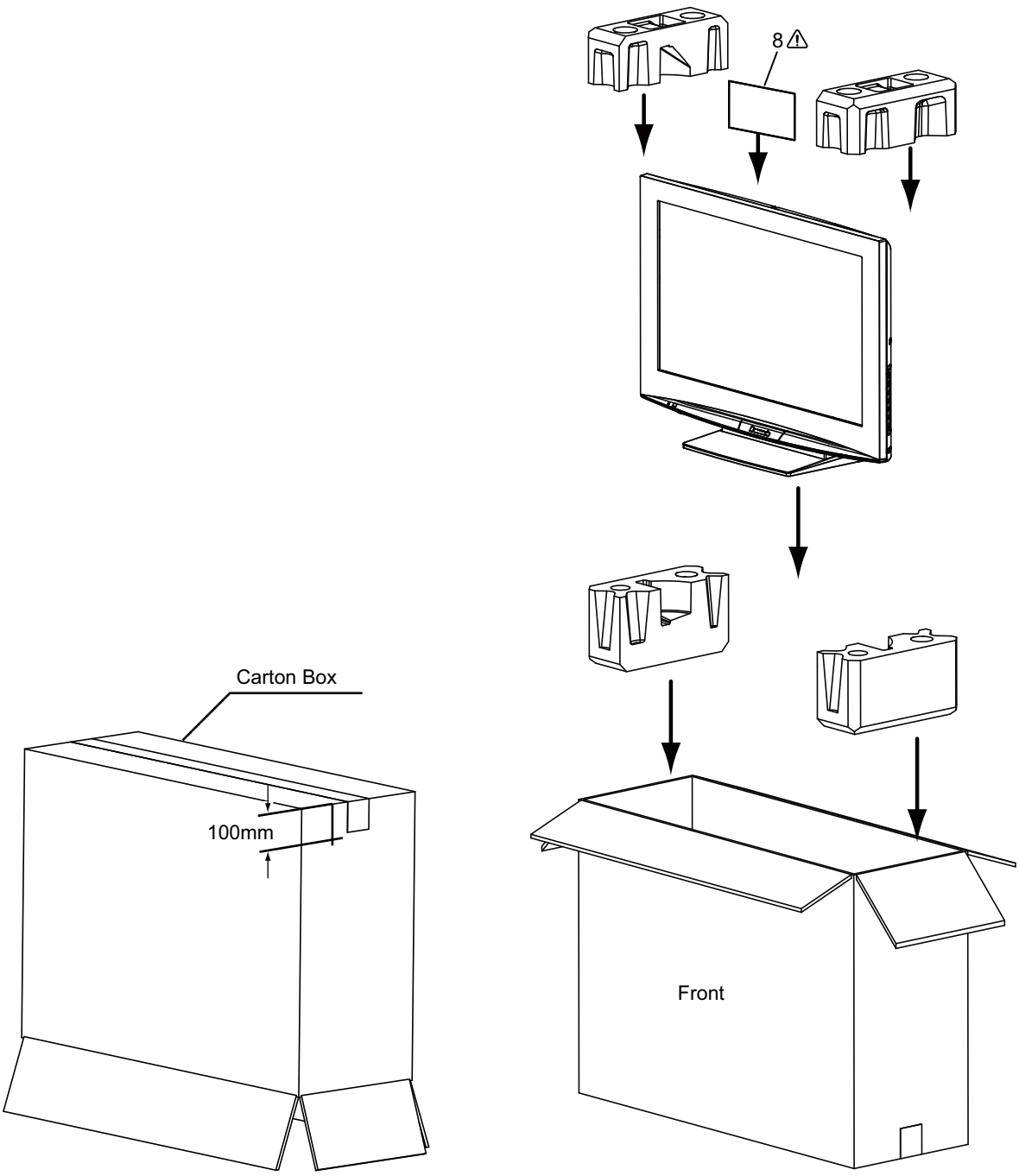
14.1. Exploded View and Mechanical Replacement Parts List (TH-32LRT12U-A)

Please click the radio button for "Diagrams II/Parts List" on the menu bar.

Explode View



Accessories and Packing

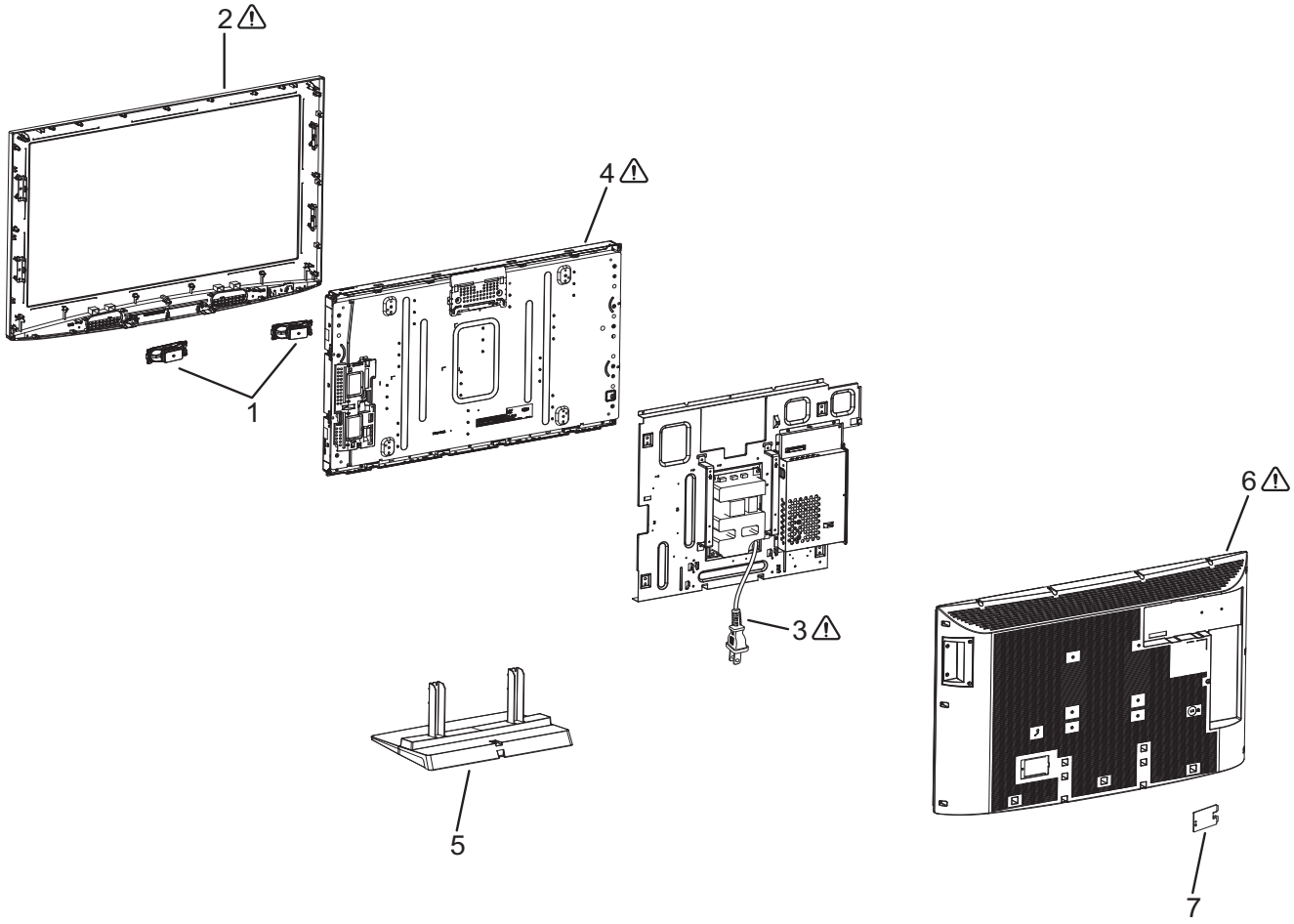


TH-32LRT12U-A Parts Lists

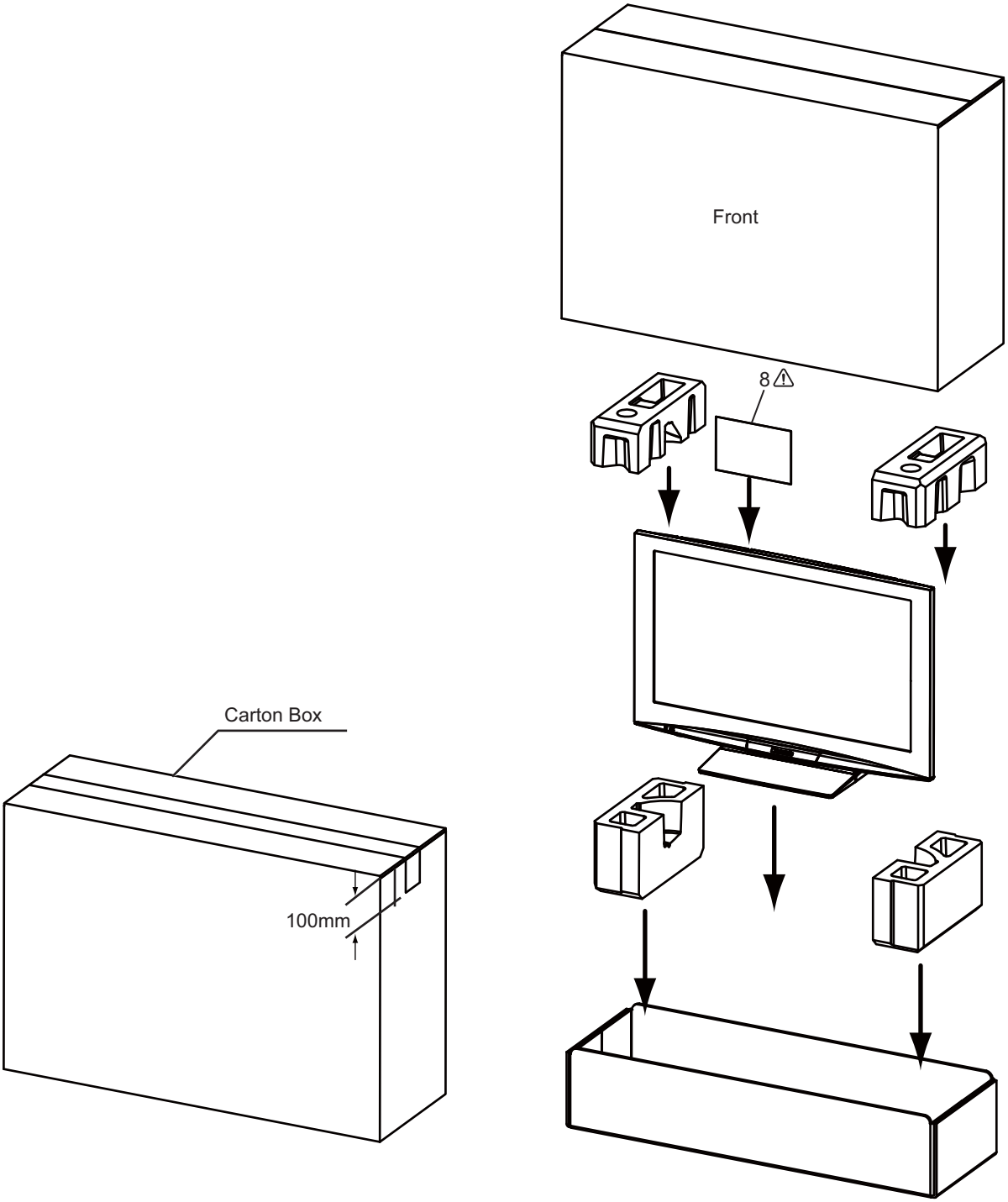
Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	1	TTX4CM008C	SPEAKER	2	
⚠	2	TTY4CM107	CABINET UNIT	1	
		TKY4CM037-01	FRONT CABINET	1	
		TES4CM016	SPRING	1	
		TBX4CM031-A	POWER BUTTON	1	
		TMM4CM079	DOOR SPRING	1	
		TBM1A036-02	BADGE	1	
		TQF4CM230	FRONT SHEET	1	
		TKP4CM074	DOOR COVER	1	
		TKP4CM73-08	FRONT PANEL	1	
		TKK4CM012	LED PANEL	1	
		XTW3+10JFN	SCREW	6	
		XTB4+15JFN	SCREW	2	
		TMK4CM195	HIMELON	2	
		TMK4CM185	HIMELON	2	
		TMK4CM186	HIMELON	2	
		TMK4CM189	HIMELON	1	
		TMK4CM190	HIMELON	1	
		XTW3+8JFN	SCREW	1	
⚠	3	TSX4CD0901F	AC CORD	1	TH-32LRT12U
⚠	3	TSX4CD0902F	AC CORD	1	TH-32LRT12M
⚠	3	TSX4CD0903F	AC CORD	1	TH-32LRT12A
⚠	4	L5EDD8Q00048	LCD PANEL	1	
	5	TTL4CM029	PEDESTAL ASSY	1	
		TBL4CM011-01	BASE COVER	1	
		TKR4CM050B-A	STAND HOLDER	2	
		TUX4CM152	BASE PLATE	1	
		TKX4CM053	ROTATE PLATE	1	
		TKX4CM050	ROTATE SHAFT(T)	1	
		TKX4CM051	ROTATE SHAFT(B)	1	
		TUX4CM151	PLATE	1	
		TUX4CM155	BASE ANGLE	1	
		TMK4CM209-01	BASE GUM	3	
		XYN4+F8FN	SCREW	4	
		XTS4+8GFN	SCREW	8	
		XYN4+F15FZ	SCREW	2	
		XTB4+8GFN	SCREW	2	
	6	TTU4CM041	BACK CABINET UNIT	1	
		TKU4CM037A	BACK COVER	1	
		TMK4CM199	HIMELON	1	
		TMK4CM200	HIMELON	1	
		TMK4CM201	HIMELON	1	
		TMK4CM202	HIMELON	1	
	7	TKK1A071-03	TRAINPOSTION BRACKET	1	
⚠	8	TQB4CM192	INSTRUCTION BOOK	1	TH-32LRT12U
⚠	8	TQB4CM172-01	INSTRUCTION BOOK	1	TH-32LRT12M
⚠	8	TQB4CM173-01	INSTRUCTION BOOK	1	TH-32LRT12A
		THT4CM028	SCREW	8	
		XTN4+15JFZ	SCREW	16	
		XTB4+15JFN	SCREW	11	
		THT4CM007	SCREW	8	
		XTB3+8JFZ	SCREW	3	
		XYN3+J8FZ	SCREW	3	
		XTW3+J10FN	SCREW	2	
		THT4CM010K	SCREW	1	
		XYN4+F15FZ	SCREW	4	
		XYN4+F10FZ	SCREW	4	
		XTB4+10FFZ	SCREW	3	

14.2. Exploded View and Mechanical Replacement Parts List (TH-37LRT12U/M/A)

Model No.: TH-37LRT12U/M/A Explode View



Accessories and Packing



TH-37LRT12U/M/A Parts List

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	1	TTX4CM008C	SPEAKER	2	
⚠	2	TTY4CM093	CABINET UNIT	1	
		TKYM039A-01	FRONT CABINET	1	
		TKP4CM081-06	FRONT PANEL	1	
		TBX4CM031	POWER BUTTON	1	
		TKK4CM012	LED PANEL	1	
		TES4CM016	SPRING	1	
		TQF4CM229	I/O SHEET	1	
		TMM4CM077	DOOR SPRING	1	
		TKP4CM082	DOOR COVER	1	
		TBM1A036-02	BADGE	1	
		XTW3+10JFN	SCREW	10	
		XTW3+8JFN	SCREW	1	
		TMK4CM188	HIMELON	1	
		TMK4CM191	HIMELON	2	
		TMK4CM213	HIMELON	2	
		TMK4CM214	HIMELON	2	
⚠	3	TSX4CD0901F	AC CORD	1	TH-37LRT12U
⚠	3	TSX4CD0902F	AC CORD	1	TH-37LRT12M
⚠	3	TSX4CD0903F	AC CORD	1	TH-37LRT12A
⚠	4	L5EDD9Q00008	LCD PANEL	1	
	5	TTL4CM028	PEDESTAL ASSY	1	
		TKR4CM055	STAND BASE	2	
		TBL4CM010-C	BASE COVER	1	
		TUX4CM150	BASE PLATE	1	
		TKX4CM049	ROTATE PLATE	1	
		TKX4CM050	ROTATE SHAFT(T)	1	
		TKX4CM051	ROTATE SHAFT(B)	1	
		TUX4CM151	PLATE	1	
		TUX4CM155	BASE ANGLE	1	
		TMK4CM119-02	BASE GUM	4	
		TMK4CM209	BASE GUM	4	
		XYN4+F10FZ	SCREW	6	
		XTS4+8GFN	SCREW	5	
		XYN4+F15FZ	SCREW	2	
		XTB4+8GFN	SCREW	2	
⚠	6	TTU4CM038	BACK CABINET UNIT	1	
		TKUM039A-01	BACK COVER	1	
		TKP4CM083	SD I/O COVER	1	
		TQF4CM199-A	SD SHEET	1	
		XTN4+12JFZ	SCREW	4	
	7	TKK1A071-03	TRAINPOSITION BRACKET	1	
⚠	8	TQB4CM192	INSTRUCTION BOOK	1	TH-37LRT12U
⚠	8	TQB4CM172-01	INSTRUCTION BOOK	1	TH-37LRT12M
⚠	8	TQB4CM173-01	INSTRUCTION BOOK	1	TH-37LRT12A
		THT4CM028	SCREW	8	
		XYN4+J6FN	SCREW	4	
		XYN4+F8FZ	SCREW	10	
		XTB4+12GFN	SCREW	19	
		YEJT034C001Z	SCREW	18	
		XTB3+8JFZ	SCREW	3	
		XYN3+J8FZ	SCREW	3	
		THT4CM010K	SCREW	1	
		XTB4+15JFZ	SCREW	14	
		XYN4+F10FZ	SCREW	2	
		XYN4+J10FZ	SCREW	4	

14.3. Electrical Replacement Parts List

14.3.1. Replacement Parts List Notes

RTL (Retention Time Limited)

Note: The marking (RTL) indicates that the Retention Time is Limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

Abbreviation of part name and description

1. Resistor

Example:

ERD25TJ104 C 100KOHM, J, 1/4W

Type Allowance

2. Capacitor

Example:

ECKF1H103ZF C 0.01UF, Z, 50V

Type Allowance

Type	Allowance
C : Carbon F : Fuse M : Metal Oxide Metal FIlm S : Solid W : Wire Wound	F : ±1% G : ±2% J : ±5% K : ±10% M : ±20%

Type	Allowance
C : Ceramic E : Electrolytic P : Polyester Polyprop lene T : Tantalum	J: ± 5% K: ± 10% M: ± 20% Z: ± 80%, -20%

14.3.2. Electrical Replacement Parts List

Note: Replacement parts are supplied in kits. To purchase, specify the number of kits to order.

Main PCB (TH-32LRT12U-A/TH-37LRT12U/M/A)

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	C10	CKO-102K0603	C 100PF,50V	1	
	C100	106M1CWD3	E 10UF,16V	1	
	C101-106	106M1CWD3	E 10UF,16V	6	
	C108	106M1CWD3	E 10UF,16V	1	
	C11	CDO-220J0603	C 22PF,50V	1	
	C110, 111	CDO-120J0603	C 12PF,50V	2	
	C112, 113	CKO-104K0603	C 0.1UF,K,50V	2	
	C114	CKO-391K0603	C 390PF,K,50V	1	
	C115	CKO-822K0603	C 8200PF,K,50V	1	
	C116, 117	CKO-105Z603	C 1UF,M,16V	2	
	C118-120	CKO-225Z0603	C 2.2UF,M,6.3V	3	
	C121-123	CKO-105Z1HWD	C 1UF,Z,50V	3	
	C125	CKO-104K0603	C 0.1UF,K,50V	1	
	C126	RCA-0R0J9GW	M 0 OHM,J	1	
	C127-129	CKO-225Z0603	C 2.2UF/6,M,3V	3	
	C130-132	CKO-105Z1HWD	C 1UF,Z.50V	3	
	C134, 135	CKO-104K0603	C 0.1UF,K,50V	2	
	C136	CDO-560J0603	C 56PF,50V	1	
	C137-139	CKO-222K0603	C 2200OF,K,50V	3	
	C14	CKO-103K0603	C 0.01UF,K,50V	1	
	C140	CKO-222K0603	C 2200PF,K,50V	1	
	C141	CKO-104K0603	C 0.1UF,K,50V	1	
	C142	106M1CWD3	E 10UF,M,16V	1	
	C143	CKO-104K0603	C 0.1UF,K,.50V	1	
	C144, 145	106M1CWD3	E 10UF,M,16V	2	
	C146-149	CKO-104K0603	C 0.01UF,K,50V	4	
	C15	CDO-330J0603	C 33OF,50V	1	
	C150	CKO-105Z0603	C 1UF,M,16V	1	
	C151	CKO-104K0603	C 0.1UF,K,50V	1	
	C152	CKO-102K0603	C 100PF,K,50V	1	
	C153	106M1CWD3	E 10UF,M,16V	1	
	C154-157	CKO-104K0603	C 0.1UF,K,50V	4	
	C158	106M1CWD3	E 10UF,M,16V	1	
	C159	CKO-104K0603	C 0.1UF,K,50V	1	
	C160	CKO-102K0603	C 1000PF,K,50V	1	
	C163	106M1CWD3	E 10UF,M,16V	1	
	C164	CKO-104K0603	C 0.1UF,K,50V	1	
	C166	106M1CWD3	E 10UF,K,50V	1	
	C167-170	CKO-104K0603	C 0.1UF,K,50V	4	
	C171	106M1CWD3	E 10UF,M,16V	1	
	C172	CKO-105Z0603	C 1UF,M,16V	1	
	C173	CKO-104K0603	C 0.1UF,M,50V	1	
	C174	106M1CWD3	E 10UF,M,16V	1	
	C175-178	CKO-104K0603	C 0.1UF,K,50V	4	
	C179	CKO-102K0603	C 1000PF,K,50V	1	
	C18	106M1CWD3	E 10UF,M,16V	1	
	C180	104K0603	C 0.1UF,K,50V	1	
	C181	CKO-105Z0603	C 1UF,M,16V	1	
	C182	104K0603A	C 0.1UF,K,50V	1	
	C183	CKO-102K0603	C 1000PF,K,50V	1	
	C184	106M1CWD3	E 10UF,M,16V	1	
	C185-189	104K0603	C 0.1UF,K,50V	5	
	C19	CKO-103K0603	C 0.01UF,K,50V	1	
	C190, 191	104K0603A	C 0.1UF,K,50V	2	
	C192	106M1CWD3	E 10UF,M,16V	1	
	C193	104K0603A	C 0.1UF,K,50V	1	
	C194	106M1CWD3	E 10UF,M,16V	1	
	C195-197	104K0603A	C 0.1UF,K,50V	3	
	C198	106M1CWD3	E 10UF,M,16V	1	
	C199	104K0603A	C 0.1UF,K,50V	1	
	C20	CKO-103K0603	C 0.01UF,K,50V	1	
	C200	106M1CWD3	E 10UF,M,16V	1	
	C201	104K0603A	C 0.1UF,K,50V	1	
	C202	CKO-102K0603	C 1000PF,K,50V	1	
	C203	106M1CWD3	E 10UF,M,16V	1	
	C204	104K0603A	C 0.1UF,K,50V	1	
	C205	CKO-102K0603	C 1000PF,K,50V	1	
	C206	104K0603A	C 0.1UF,K,50V	1	
	C207	CKO-102K0603	C 1000PF,K,50V	1	
	C208	104K0603A	C 0.1UF,K,50V	1	
	C209	106M1CWD3	E 10UF,M,16V	1	
	C210	CKO-102K0603	C 1000PF,K,50V	1	
	C211	106M1CWD3	E 10UF,M,16V	1	
	C212, 213	104K0603A	C 0.1UF,K,50V	2	
	C215, 216	104K0603A	C 0.1UF,K,50V	2	
	C217	107M1CWD1	E 100UF,16V	1	
	C218	227M1VWD1	E 220UF,35V	1	
	C22	CDO-220J0603	C 22PF,50V	1	
	C220-235	104K0603A	C 0.1UF,K,50V	16	
	C236-239	CKO-475K0603	C 4.7UF,K,6.3V	4	
	C24	CDO-330J0603	C 33PF,50V	1	
	C240, 241	107M1CWD1	E 100UF,16V	2	
	C242	104K0603A	C 0.1UF,K,50V	1	
	C244	104K0603A	C 0.1UF,K,50V	1	
	C245	107M1CWD1	E 100UF,16V	1	
	C246-248	104K0603A	C 0.1UF,K,50V	3	
	C250	104K0603A	C 0.1UF,K,50V	1	
	C251	107M1CWD1	E 100UF,16V	1	
	C252	104K0603A	C 0.1UF,K,50V	1	
	C253	107M1CWD1	E 100UF,16V	1	
	C254	104K0603A	C 0.1UF,K,50V	1	
	C255	107M1CWD1	E 100UF, 16V	1	
	C256	104K0603A	C 0.1UF,K,50V	1	
	C257	107M1CWD1	E 100UF, 16V	1	
	C26	106M1CWD3	E 10UF,M,16V	1	
	C262	107M1CWD1	E 100UF,16V	1	
	C263	104K0603A	C 0.1UF,K,50V	1	
	C264	107M1CWD1	E 100UF,16V	1	
	C265	104K0603A	C 0.1UF,K,50V	1	
	C266	227M1VWD1	E 220UF,35V	1	
	C267, 268	104K0603A	C 0.1UF,K,50V	2	
	C269	107M1CWD1	E 100UF,16V	1	
	C27	CKO-103K0603	C 0.01UF,K,50V	1	
	C270	104K0603A	C 0.1UF,K,50V	1	
	C271	106M1CWD3	E 10UF,M,16V	1	
	C272	107M1CWD1	E 100UF,16V	1	
	C273	104K0603A	C 0.1UF,K,50V	1	
	C274	107M1CWD1	E 100UF,16V	1	
	C275	104K0603A	C 0.1UF,K,50V	1	
	C276	107M1CWD1	E 100UF,16V	1	
	C277	104K0603A	C 0.1UF,K,50V	1	
	C278	107M1CWD1	E 100UF,16V	1	
	C279	104K0603A	C 0.1UF,K,50V	1	
	C28	CDO-220J0603	C 22PF,50V	1	
	C280	104K0603A	C 0.1UF,K,50V	1	
	C282	107M1CWD1	E 100UF,16V	1	
	C283	104K0603A	C 0.1UF,K,50V	1	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	C284	107M1CWD1	E 100UF,16V	1	
	C285	104K0603A	C 0.1UF,K,50V	1	
	C286	CEA-108M1VUT	E 1000UF,35V	1	
	C287, 288	104K0603A	C 0.1UF,K,50V	2	
	C289	227M1VWD1	E 220UF,35V	1	
	C290	104K0603A	C 0.1UF,K,50V	1	
	C30	CDO-470J0603	C 47PF,50V	1	
	C309	335M1HWD1	E 3.3UF,50V	1	
	C311	CDO-470J0603	C 47PF,50V	1	
	C314	335M1HWD1	E 3.3UF,50V	1	
	C317	CDO-470J0603	C 47PF,50V	1	
	C318, 319	CEA-108M1VUT	E 1000UF,35V	2	
	C32	CDO-470J0603	C 47PF,50V	1	
	C321	RCA-0R0J9GW	M 0 OHM,J	1	
	C322	CKO-474Z0603	C 0.47UF,Z,25V	1	
	C326	RCA-0R0J9GW	M 0 OHM,J	1	
	C327	CKO-474Z0603	C 0.47UF,Z,25V	1	
	C329	227M1VWD1	E 220UF,35V	1	
	C331	CEA-106M1HWD	C 10UF,50V	1	
	C332	CEA-107M1VWD	E 100UF,35V	1	
	C333	336M1EWD1	E 33UF,25V	1	
	C334	104K0603A	C 0.1UF,K,50V	1	
	C338	106M1CWD3	E 10UF,M,16V	1	
	C339	CEA-105M1HWD	E 1UF,50V	1	
	C356	RCA-0R0J9GW	M 0 OHM,J	1	
	C366	104K0603A	C 0.1UF,K,50V	1	
	C367	106M1CWD3	E 10UF,M,16V	1	
	C37	104K0603A	C 0.1UF,K,50V	1	
	C370	107M1CWD1	E 100UF,16V	1	
	C372	104K0603A	C 0.1UF,K,50V	1	
	C373	106M1CWD3	E 10UF,M,16V	1	
	C374	104K0603A	C 0.1UF,K,50V	1	
	C375	106M1CWD3	E 10UF,M,16V	1	
	C376	104K0603A	C 0.1UF,K,50V	1	
	C377	106M1CWD3	E 10UF,M,16V	1	
	C378	104K0603A	C 0.1UF,K,50V	1	
	C379	106M1CWD3	E 10UF,M,16V	1	
	C38	CKO-471K0603	C 470PF,K,50V	1	
	C380	104K0603A	C 0.1UF,K,50V	1	
	C381	106M1CWD3	E 10UF,M,16V	1	
	C382	104K0603A	C 0.1UF,K,50V	1	
	C383	106M1CWD3	E 10UF,M,16V	1	
	C384	104K0603A	C 0.1UF,K,50V	1	
	C385	106M1CWD3	E 10UF,M,16V	1	
	C386	104K0603A	C 0.1UF,K,50V	1	
	C387	106M1CWD3	E 10UF,M,16V	1	
	C388	104K0603A	C 0.1UF,K,50V	1	
	C4	CKO-103K0603	C 0.01UF,K,50V	1	
	C40	CKO-471K0603	C 470UF,K,50V	1	
	C458, 459	106M1CWD3	E 10UF,M,16V	2	
	C491	107M1CWD1	E 100UF,16V	1	
	C492	227M1VWD1	E 220U,35V	1	
	C493	104K0603A	C 0.1UF,K,50V	1	
	C494	107M1CWD1	E 100UF,16V	1	
	C495, 496	104K0603A	C 0.1UF,K,50V	2	
	C498	104K0603A	C 0.1UF,K,50V	1	
	C505, 506	CDO-220J0603	C 22PF,50V	2	
	C508	107M1C1WD1	E 100UF,16V	1	
	C509	104K0603A	C 0.1UF,K,50V	1	
	C510	107M1C1WD1	E 100UF,16V	1	
	C511, 512	104K0603A	C 0.1UF,K,50V	2	
	C514	475M1VWD1	E 4.7UF,35V	1	
	C516	107M1C1WD1	E 100UF,16V	1	
	C532, 533	CKO-471K0603	C 470PF,50V	2	
	C534, 535	4R7C1H0402	C 4.7PF,50V	2	
	C542-545	CDO-470J0603	C 47PF,50V	4	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	C549-552	CKO-471K0603	C 470PF,50V	4	
	C555, 556	CKO-471K0603	C 470PF,50V	2	
	C557	106M1H1UT1	E 10UF,50V	1	
	C559	106M1H1UT1	E 10UF,50V	1	
	C6	CDO-330J0603	C 33PF,50V	1	
	C65	106M1CWD3	E 10UF,16V	1	
	C66-77	104K0603A	C 0.1UF,K,50V	12	
	C78, 79	106M1CWD3	E 10UF,M,16V	2	
	C8	106M1CWD3	E 10UF,M,16V	1	
	C80, 81	104K0603A	C 0.1UF,K,50V	2	
	C84	107M1CWD1	E 100UF,16V	1	
	C85	104K0603A	C 0.1UF,K,50V	1	
	C86-89	CKO-474Z0603	C 0.47UF,Z,25V	4	
	C9	CKO-103K0603	C 0.01UF,K,50V	1	
	C90	CKO0103K0603	C 0.01UF,K,50V	1	
	C91, 92	CKO-474Z0603	C 0.47UF,Z,25V	2	
	C93	CKO-103K0603	C 0.01UF,K,50V	1	
	C94	CKO-474Z0603	C 0.47UF,Z,25V	1	
	C95	CKO-103K0603	C 0.01UF,K,50V	1	
	C96	CKO-474Z0603	C 0.47UF,Z,25V	1	
	C97	CKO-103K0603	C 0.01UF,K,50V	1	
	C98	106M1CWD3	E 10UF,M,16V	1	
	C99	CKO-102K0603	C 1000PF,K,50V	1	
	CN1	ZSO-8P-S	8P CONNECTOR	1	
	CN6	JAK-KM04022	JACK	1	
	CON1	QNC-01SEC-LF	14P CONNECTOR	1	
	CON10	QNC-01S3C-LF	3P CONNECTOR	1	
	CON11, 12	QNC-01S2C-LF	2P CONNECTOR	2	
	CON13	QNC-01S5C-LF	5P CONNECTOR	1	
	CON16	JAK-HDMI-F3	HDMI JACK	1	
	CON34	QNC-01S3C-LF	3P CONNECTOR	1	
	CON35	WFR-LH16*2D	32P CONNECTOR	1	
	CON5, 6	JAK-HDMI-F3	HDMI JACK	2	
	CON7	QNC-01S5C-LF	5P CONNECTOR	1	
	CON8	QNC-01S7C-LF	7P CONNECTOR	1	
	CONA6	QNC-01S5C-LF	5P CONNECTOR	1	
	D10	MDI-LL4148	DIODE	1	
	D11-17	MDI-ES3DB	DIODE	7	
	D28	MDI-ES3DB	DIODE	1	
	D32-36	MDI-MBR0520	DIODE	5	
	D39	MDI-LL4148	DIODE	1	
	D4	MDI-MBR0520	DIODE	1	
	D41, 42	MDI-MBR0520	DIODE	2	
	D5	MDI-MBR0520	DIODE	1	
	D7-9	MDI-LL4148	DIODE	3	
	FB1	0R0J94W-1	M 0 OHM,J	1	
	FB10	MCK-3225S600	CHIP INDUCTOR	1	
	FB12, 13	MCK-3225S600	CHIP INDUCTOR	2	
	FB15-19	MCK-3225S600	CHIP INDUCTOR	5	
	FB2	0R0J94W-1	M 0 OHM,J	1	
	FB20-27	MCK-3225S600	CHIP INDUCTOR	8	
	FB28	0R0J94W-1	M 0 OHM,J	1	
	FB29	MCK-3225S600	CHIP INDUCTOR	1	
	FB3	0R0J94W-1	M 0 OHM,J	1	
	FB30	MCK-3225S600	CHIP INDUCTOR	1	
	FB31-39	MCL-FB321611	CHIP INDUCTOR	9	
	FB4	MCL-FB321611	CHIP INDUCTOR	1	
	FB41, 42	FB181025-T	INDUCTION COIL	2	
	FB43	MCK-3225S600	CHIP INDUCTOR	1	
	FB47	MCK-3225S600	CHIP INDUCTOR	1	
	FB48, 49	MCL-FB321611	CHIP INDUCTOR	2	
	FB5	MCL-FB321611	CHIP INDUCTOR	1	
	FB50, 51	MCL-FB321611	CHIP INDUCTOR	2	
	FB6-9	MCL-FB321611	CHIP INDUCTOR	4	
	J1	JAK-22-0686	JACK	1	
	J15	QNC-01S4C-LF	4P CONNECTOR	1	
	J2	JAK-15DS-3A	JACK	1	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	J257	FB181025-T	INDUCTION COIL	1	
	J3	KM04024-03	JACK	1	
	J4	JAK-EAR02	JACK	1	
	J5	QNC-01SGC-LF	16P CONNECTOR	1	
	J7	QNC-03C20*2W	40P CONNECTOR	1	
	J8	QNC-01S4C-LF	4P CONNECTOR	1	
	L14	0R0J94W-1	M 0 OHM,J	1	
	L18, 19	0R0J94W-1	M 0 OHM,J	2	
	L2-4	0R0J94W-1	M 0 OHM,J	3	
	L20	0R0J94W-1	M0 OHM,J	1	
	L51	MCL-FB321611	CHIP INDUCTOR	1	
	Q10-12	MTR-2SC2411	TRANSISTOR	3	
	Q15-17	MTR-AP9435GM	FET	3	
	Q19-21	MRT-2SC2411	TRANSISTOR	3	
	Q24	MTR-2SC2411	TRANSISTOR	1	
	Q27-31	MIC-2SK2158	NFET	5	
	Q32, 33	MTR-PMBS3904	TRANSISTOR	2	
	Q5	MIC-EM6353	IC	1	
	Q7, 8	MIC-2SK2158	NFET	2	
	R1	RCA-750J9GW	M 75 OHM,J	1	
	R10	RCA-474J9GW	M 47K OHM,J	1	
	R100	RCA-0R0J9GW	M 0 OHM,J	1	
	R101	RCA-220J9GW	M 22 OHM,J	1	
	R102	RCA-104J9GW	M 100K OHM,J	1	
	R104	RCA-102J9GW	M 1K OHM,J	1	
	R105, 106	RCA-104J9GW	M 100K OHM,J	2	
	R107	RCA-242J9GW	M 2.4K OHM,J	1	
	R108, 109	RCA-473J9GW	M 47K OHM,J	2	
	R11	RCA-473J9GW	M 47K OHM,J	1	
	R110, 111	RCA-330J9GW	M 33 OHM,J	2	
	R117	RCA-102J9GW	M 1K OHM,J	1	
	R122	RCA-0R0J9GW	M 0 OHM,J	1	
	R124	RCA-0R0J9GW	M 0 OHM,J	1	
	R126	RCA-0R0J9GW	M 0 OHM,J	1	
	R128, 129	RCA-221J9GW	M 220 OHM,J	1	
	R130	RCA-105J9GW	M 1M OHM,J	1	
	R131, 132	RCA-330J9GW	M 33 OHM,J	2	
	R133	RCA-472J9GW	M 4.7K OHM,J	1	
	R134	RCA-103J9GW	M 10K OHM,J	1	
	R135-137	RCA-330J9GW	M 33 OHM,J	3	
	R138	RCA-472J9GW	M 4.7K OHM,J	1	
	R143	RCA-473J9GW	M 47K OHM,J	1	
	R145	RCA-472J9GW	M 4.7K OHM,J	1	
	R148-150	RCA-472J9GW	M 4.7K OHM,J	3	
	R151	RCA-562J9GW	M 5.6K OHM,J	1	
	R152, 153	RCA-330J9GW	M 33 OHM,J	2	
	R154	RCA-0R0J9GW	M 0 OHM,J	1	
	R163	RCA-0R0J9GW	M 0 OHM,J	1	
	R164-170	RCA-221J9GW	M 220 OHM,J	7	
	R17	RCA-750J9GW	M 75 OHM,J	1	
	R171	RCA-0R0J9GW	M 0 OHM,J	1	
	R172	RCA-330J9GW	M 33 OHM,J	1	
	R173, 174	RCA-472J9GW	M 4.7K OHM,J	2	
	R175-182	RCA-330J9GW	M 33 OHM,J	8	
	R18	RCA-750J9GW	M 75 OHM,J	1	
	R186-190	RCA-103J9GW	M 10K OHM,J	5	
	R19	RCA-750J9GW	M 75 OHM,J	1	
	R192	RCA-102J9GW	M 1K OHM,J	1	
	R2	RCA-750J9GW	M 75 OHM,J	1	
	R200, 201	RCA-0R0J9GW	M 0 OHM,J	2	
	R202, 203	RCA-472J9GW	M 4.7K OHM,J	2	
	R205	RCA-183J9GW	M 18K OHM,J	1	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	R206	RCA-330J9GW	M 33 OHM,J	1	
	R207, 208	RCA-103J9GW	M 10K OHM,J	2	
	R209	RCA-330J9GW	M 33 OHM,J	1	
	R21	RCA-220J9GW	M 22 OHM,J	1	
	R210-212	RCA-103J9GW	M 10K OHM,J	3	
	R214	RCA-220J9GW	M 22 OHM,J	1	
	R217	RCA-103J9GW	M 10K OHM,J	1	
	R219, 220	RCA-103J9GW	M 10K OHM,J	2	
	R221	RCA-220J9GW	M 22 OHM,J	1	
	R223, 224	RCA-103J9GW	M 10K OHM,J	2	
	R227	RCA-183J9GW	M 18K OHM,J	1	
	R232-237	RCA-103J9GW	M 10K OHM,J	6	
	R238	RCA-101J9GW	M 100 OHM,J	1	
	R24	RCA-473J9GW	M 47K OHM,J	1	
	R248, 249	RCA-220J9GW	M 22 OHM,J	2	
	R25	RCA-473J9GW	M 47K OHM,J	1	
	R251	RCA-103J9GW	M 10K OHM,J	1	
	R258, 259	RCA-103J9GW	M 10K OHM,J	2	
	R26	RCA-101J9GW	M 100 OHM,J	1	
	R260	RCA-102J9GW	M 1K OHM,J	1	
	R263	RCA-102J9GW	M 1K OHM,J	1	
	R264	RCA-0R0J9GW	M 0 OHM,J	1	
	R265	RCA-472J9GW	M 4.7K OHM,J	1	
	R266	RCA-392J9GW	M 3.9K OHM,J	1	
	R268	RCA-473J9GW	M 47K OHM,J	1	
	R269	RCA-0R0J9GW	M 0 OHM,J	1	
	R27	RCA-750J9GW	M 75 OHM,J	1	
	R28	RCA-103J9GW	M 10K OHM,J	1	
	R286	RCA-101J9GW	M 100 OHM,J	1	
	R287	RCA-563J9GW	M 56K OHM,J	1	
	R29	RCA-101J9GW	M 100 OHM,J	1	
	R291	RCA-101J9GW	M 100 OHM,J	1	
	R292	RCA-563J9GW	M 56K OHM,J	1	
	R293	RCA-102J9GW	M 1K OHM,J	1	
	R294	RCA-562J9GW	M 5.6K OHM,J	1	
	R297	RCA-102J9GW	M 1K OHM,J	1	
	R299	RCA-103J9GW	M 10K OHM,J	1	
	R3	RCA-750J9GW	M 75 OHM,J	1	
	R30	RCA-0R0J9GW	M 0 OHM,J	1	
	R300	RCA-562J9GW	M 5.6K OHM,J	1	
	R304	RCA-393J9GW	M 39K OHM,J	1	
	R305-309	RCA-103J9GW	M 10K OHM,J	3	
	R308	RCA-0R0J9GW	M 0 OHM,J	1	
	R309	RCA-103J9GW	M 10K OHM,J	1	
	R31	RCA-750J9GW	M 75 OHM,J	1	
	R311	RCA-0R0J9GW	M 0 OHM,J	1	
	R312	RCA-473J9GW	M 47K OHM,J	1	
	R313	RCA-103J9GW	M 10K OHM,J	1	
	R315, 316	RCA-472J9GW	M 4.7K OHM,J	2	
	R32	RCA-103J9GW	M 10K OHM,J	1	
	R320, 321	RCA-330J9GW	M 33 OHM,J	2	
	R328	RCA-331J9GW	M 330 OHM,J	1	
	R33	RCA-101J0GW	M 100 OHM,J	1	
	R331	RCA-103J9GW	M 10K OHM,J	1	
	R333, 334	RCA-473J9GW	M 47K OHM,J	2	
	R34	RCA-750J9GW	M 75 OHM,J	1	
	R342	RCA-750J9GW	M 75 OHM,J	1	
	R343, 344	RCA-330J9GW	M 33 OHM,J	2	
	R35	RCA-103J9GW	M 10K OHM,J	1	
	R36	RCA-101J9GW	M 100 OHM,J	1	
	R360	RCA-103J9GW	M 10K OHM,J	1	
	R37	RCA-101J9GW	M 100 OHM,J	1	
	R370	RCA-0R0J9GW	M 0 OHM,J	1	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	R376	RCA-0R0J9GW	M 0 OHM,J	1	
	R38, 39	RCA-750J9GW	M 75 OHM,J	2	
	R395, 396	RCA-0R0J9GW	M 0 OHM,J	2	
	R397	RCA-472J9GW	M 4.7K OHM,J	1	
	R4	RCA-750J9GW	M 75 OHM,J	1	
	R40	RCA0103J9GW	M 10K OHM,J	1	
	R404-406	RCA-0R0J9GW	M 0 OHM,J	3	
	R407, 408	RCA-103J9GW	M 10K OHM,J	2	
	R409, 410	RCA-682J9GW	M 6.8K OHM,J	2	
	R412	RCA-103J9GW	M 10K OHM,J	1	
	R413, 414	RCA-682J9GW	M 6.8K OHM,J	2	
	R42	RCA-103J9GW	M 10K OHM,J	1	
	R424, 425	RCA-103J9GW	M 10K OHM,J	2	
	R426, 427	RCA-682J9GW	M 6.8K OHM,J	2	
	R428	RCA-221J9GW	M 220 OHM,J	1	
	R429	RCA-101J9GW	M 100 OHM,J	1	
	R43	RCA-0R0J9GW	M 0 OHM,J	1	
	R433, 434	RCA-472J9GW	M 4.7K OHM,J	2	
	R443, 444	RCA-472J9GW	M 4.7K OHM,J	2	
	R446, 447	RCA-472J9GW	M 4.7K OHM,J	2	
	R448	RCA-203J9GW	M 20K OHM,J	1	
	R45	RCA-101J9GW	M 100 OHM,J	1	
	R451	RCA-203J9GW	M 20K OHM,J	1	
	R454, 455	RCA-103J9GW	M 10K OHM,J	2	
	R456	RCA-472J9GW	M 4.7K OHM,J	1	
	R457	RCA-183J9GW	M 18K OHM,J	1	
	R458	RCA-103J9GW	M 10K OHM,J	1	
	R459	RCA-220J9GW	M 22 OHM,J	1	
	R46	BLM18PG121D	M 120 OHM	1	
	R460	RCA-220J9GW	M 22 OHM,J	1	
	R461, 462	RCA-103J9GW	M 10K OHM,J	2	
	R463	RCA-102J9GW	M 1K OHM,J	1	
	R469	RCA-103J9GW	M 10K OHM,J	1	
	R47	BLM18PG121D	M 120 OHM	1	
	R471	RCA-103J9GW	M 10K OHM,J	1	
	R472	RCA-203J9GW	M 20K OHM,J	1	
	R48	RCA-750J9GW	M 75 OHM,J	1	
	R482	RCA-473J9GW	M 47K OHM,J	1	
	R484	RCA-330J9GW	M 33 OHM,J	1	
	R485	RCA-102J9GW	M 1K OHM,J	1	
	R487	RCA-103J9GW	M 10K OHM,J	1	
	R488	RCA-203J9GW	M 20K OHM,J	1	
	R49	RCA-103J9GW	M 10K OHM,J	1	
	R491	RCA-102J9GW	M 1K OHM,J	1	
	R493	RCA-102J9GW	M 1K OHM,J	1	
	R494	RCA-330J9GW	M 33 OHM,J	1	
	R496	RCA-181J9GW	M 180 OHM,J	1	
	R498	RCA-181J9GW	M 180 OHM,J	1	
	R499	RCA-331J9GW	M 330 OHM,J	1	
	R5	RCA-750J9GW	M 75 OHM,J	1	
	R50	RCA-103J9GW	M 10K OHM,J	1	
	R500	RCA-103J9GW	M 10K OHM,J	1	
	R504	RCA-102J9GW	M 1K OHM,J	1	
	R505	RCA-330J9GW	M 33 OHM,J	1	
	R508-510	RCA-330J9GW	M 33 OHM,J	3	
	R512	RCA-330J9GW	M 33 OHM,J	1	
	R514	RCA-330J9GW	M 33 OHM,J	1	
	R518	RCA-0R0J9GW	M 0 OHM,J	1	
	R519	RCA-473J9GW	M 47K OHM,J	1	
	R52	RCA-103J9GW	M 10K OHM,J	1	
	R520	RCA-473J9GW	M 47K OHM,J	1	
	R521, 522	RCA-750J9GW	M 75 OHM,J	2	
	R523, 524	RCA-330J9GW	M 33 OHM,J	2	
	R53	RCA-103J9GW	M 10K OHM,J	1	
	R530, 531	RCA-330J9GW	M 33 OHM,J	2	
	R535	RCA-0R0J9GW	M 0 OHM,J	1	
	R537	RCA-0R0J9GW	M 0 OHM,J	1	
	R539	RCA-330J9GW	M 33 OHM,J	1	
	R54	RCA-103J9GW	M 10K OHM,J	1	
	R540	RCA-103J9GW	M 10K OHM,J	1	
	R544, 545	RCA-103J9GW	M 10K OHM,J	2	
	R546	RCA-473J9GW	M 47K OHM,J	1	
	R547-549	RCA-0R0J9GW	M 0 OHM,J	3	
	R55	RCA-473J9GW	M 47K OHM,J	1	
	R550-561	RCA-0R0J9GW	M 0 OHM,J	12	
	R56	RCA-473J9GW	M 47K OHM,J	1	
	R562	RCA-103J9GW	M 10K OHM,J	1	
	R563, 564	RCA-0R0J9GW	M 0 OHM,J	2	
	R565	RCA-472J9GW	M 4.7K OHM,J	1	
	R566, 567	RCA-103J9GW	M 10K OHM,J	2	
	R568	RCA-473J9GW	M 47K OHM,J	1	
	R569	RCA-330J9GW	M 33 OHM,J	1	
	R57	RCA-102J9GW	M 1K OHM,J	1	
	R570	RCA-330J9GW	M 33 OHM,J	1	
	R571	RCA-103J9GW	M 10K OHM,J	1	
	R573, 574	RCA-330J9GW	M 33 OHM,J	1	
	R577	RCA-472J9GW	M 4.7K OHM,J	1	
	R58	RCA-330J9GW	M 33 OHM,J	1	
	R581	RCA-472J9GW	M 4.7K OHM,J	1	
	R584-586	RCA-0R0J9GW	M 0 OHM,J	3	
	R588	RCA-0R0J9GW	M 0 OHM,J	1	
	R59	RCA-330J9GW	M 33 OHM,J	1	
	R593-596	RCA-0R0J9GW	M 0 OHM,J	4	
	R597, 598	RCA-103J9GW	M 10K OHM,J	2	
	R599	RCA-0R0J9GW	M 0 OHM,J	1	
	R6	RCA-750J9GW	M 75 OHM,J	1	
	R60	RCA-473J9GW	M 47K OHM,J	1	
	R600	RCA-103J9GW	M 10K OHM,J	1	
	R601	RCA-472J9GW	M 4.7K OHM,J	1	
	R602, 603	RCA-0R0J9GW	M 0 OHM,J	2	
	R604	RCA-472J9GW	M 4.7K OHM,J	1	
	R606	RCA-330J9GW	M 33 OHM,J	1	
	R608	RCA-331J9GW	M 120 OHM,J,1/2W		
	R609	RCA-331J9GW	M 150 OHM,J,1/2W	1	
	R61	RCA-473J9GW	M 47K OHM,J	1	
	R7	RCA-473J9GW	M 47K OHM,J	1	
	R73	RCA-220J9GW	M 22 OHM,J	1	
	R75	RCA-100J9GW	M 10 OHM,J	1	
	R8	RCA-473J9GW	M 47K OHM,J	1	
	R82	RCA-102J9GW	M 1K OHM,J	1	
	R94, 95	RCA-473J9GW	M 47K OHM,J	2	
	R96	RCA-330J9GW	M 33 OHM,J	1	
	R98	RCA-330J9GW	M 33 OHM,J	1	
	R99	RCA-220J9GW	M 22 OHM,J	1	
	RP1	CRN-220J8P	RESISTOR ARRAY	1	
	RP10	CRN-220J8P	RESISTOR ARRAY	1	
	RP11, 12	CRN-221J8P	RESISTOR ARRAY	2	
	R13	CRN-220J8P	RESISTOR ARRAY	1	
	RP14	CRN-221J8P	RESISTOR ARRAY	1	
	RP15, 16	CRN-220J8P	RESISTOR ARRAY	2	
	RP17	CRN-221J8P	RESISTOR ARRAY	1	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	RP18, 19	CRN-220J8P	RESISTOR ARRAY	2	
	RP2	CRN-221J8P	RESISTOR ARRAY	1	
	RP21, 22	CRN-224J8P	RESISTOR ARRAY	2	
	RP25	CRN-472J8P	RESISTOR ARRAY	1	
	RP26-29	CRN-0R0J8P	RESISTOR ARRAY	4	
	RP3	CRN-221J8P	RESISTOR ARRAY	1	
	RP30	CRN-0R0J8P	RESISTOR ARRAY	1	
	RP4	CRN-220J8P	RESISTOR ARRAY	1	
	RP5, 6	CRN-221J8P	RESISTOR ARRAY	2	
	RP7	CRN-220J8P	RESISTOR ARRAY	1	
	RP8, 9	CRN-221J8P	RESISTOR ARRAY	2	
	SW1	ZSW-012	SWITCH	1	
	U1	MIC-74HC14	IC	1	
	U10	RCLAMP0514M	IC	1	
	U11	MIC-CAT6353	IC	1	
	U12	MIC-M52790FP	IC	1	
	U14	MIC-SPV7100P	IC	1	
	U15	MIC24LC16BT	IC	1	
	U16	58C2128164	IC	1	
	U17	58C2128464	IC	1	
	U18	MIC-AP1250GM	IC	1	
	U20	MIC-74HC4052	IC	1	
	U21	MIC-PCA9555	IC	1	
	U24	APE1117K-33	IC	1	
	U25	APE1117K-ADJ	IC	1	
	U27	APE1084-33	IC	1	
	U28	MIC-AN78D08A	IC	1	
	U29	APE1084-ADJ	IC	1	
	U30	APE1117K-33	IC	1	
	U31	APE1117K-18	IC	1	
	U34	DIC-TDA8947J	IC	1	
	U35	24LC08B-6	IC	1	
	U36	RCLAMP0514M	IC	1	
	U37	RCLAMO0514M	IC	1	
	U38	24LC08B-7	IC	1	
	U39	WT6702F-1	IC	1	
	U4,40	APE1117K-33	IC	2	
	U41, 42	MTR-AP9435GM	IC	2	
	U43	MIC-74HC4052	IC	1	
	U44	MIC-74HC4052	IC	1	
	U45	MIC-AN78D05A	IC	1	
	U5, 6	RCLAMP0514M	IC	2	
	U8	24LC08B-5	IC	1	
	U9	RCLAMP0514M	IC	1	
	X1	27.000-15	CRYSTAL	1	
	X2	32.768-20	CRYSTAL	1	
	Z1, 2	ZMM55C6V8	ZENER DIODE	2	
	Z10-23	ZMM55C6V8	ZENER DIODE	24	
	Z27	RCLAMP0502B	ZENER DIODE	1	
	Z28	ZMM55C6V8	ZENER DIODE	1	
	Z29	RCLAMP0502B	ZENER DIODE	1	
	Z3	ZMM55C6V8	ZENER DIODE	1	
	Z32	ZMM55C6V8	ZENER DIODE	1	
	Z34-37	ZMM55C6V8	ZENER DIODE	4	
	Z4	ZMM55C6V8	ZENER DIODE	1	
	Z47	ZMM55C6V8	ZENER DIODE	1	
	Z48	RCLAMP0502B	ZENER DIODE	1	
	Z5-7	ZMM55C6V8	ZENER DIODE	3	
	Z50-68	ZMM55C6V8	ZENER DIODE	19	
	Z70	ZMM55C6V8	ZENER DIODE	1	
	Z71	MZD-SD12TCT	ZENER DIODE	1	
	Z73	ZMM55C6V8	ZENER DIODE	1	

RS232 PCB (TH-32LRT12U-A/TH-37LRT12U/M/A)

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
	C1-5	CKO-104K0603	C 0.1UF,50V	5	
	U1	ADM3232EARNZ	IC	1	
	JI	JAK-09GS-2A	JACK	1	
	CON1	QNC-01V4C-LF	4P CONNECTOR	1	

AV3 PCB (TH-32LRT12U-A)

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
	CON32	KM04018A-03	JACK	1	
	CON33	QNC-01VEC-LF	14P CONNECTOR	1	

Key PCB (TH-32LRT12U-A)

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
	C245	CEA-107M1CWD1	E 100UF,16V	1	
	C278	CKO-104K0603	C 0.1UF,K,50V	1	
	CON34	QNC-01V3C-LF	3P CONNECTOR	1	
	R146	RCA-472J9GW	M 4.7K OHM,J	1	
	R148	RCA-152J9GW	M 1.5K OHM,J	1	
	R149	RCA-332J9GW	M 3.3K OHM,J	1	
	R150	RCA-682J9GW	M 6.8K OHM,J	1	
	R151, 152	RCA-183J9GW	M 18K OHM,J	2	
	SW2-7	ZSW-012	SWITCH	6	

IR PCB (TH-32LRT12U-A/TH-37LRT12U/M/A)

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
	C591	CKO-104K0603	C 0.1UF,K,50V	1	
	CON42	QNC-01V7C-LF	7P CONNECTOR	1	
	LED1	JTK255B3CH	LED	1	
	QA1,A2	MTR-2SC2411	TRANSISTOR	2	
	R1	RCA-331J9GW	M 330 OHM,J	1	
	RA1	RCA-821J9GW	M 820 OHM,J	1	
	RA2	RCA-332J9GW	M 3.3K OHM,J	1	
	RA3	RCA-681J9GW	M 680 OHM,J	1	
	RA4	RCA-332J9GW	M 3.3K OHM,J	1	
	RA5,A6	RCA-0R0J9GW	M 0 OHM,J	2	
	SW1	ZSW-012	SWITCH	1	
	Z38	MZD-HZK3C	ZENER DIODE	1	

AV3 + Key PCB (TH-37LRT12U/M/A)

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
	C245	CEA-107M1CWD	E 100UF,16V	1	
	C278	CKO-104K0603	C 0.1UF,K,50V	1	
	CON32	KM04018A-03	JACK	1	
	CON33	QNC-01VEC-LF	14P CONNECTOR	1	
	CON34	QNC-01V3C-LF	3P CONNECTOR	1	
	R146	RCA-472J9GW	M 4.7K OHM,J	1	
	R148	RCA-152J9GW	M 1.5K OHM,J	1	
	R149	RCA-332J9GW	M 3.3 OHM,J	1	
	R150	RCA-682J9GW	M 6.8K OHM,J	1	
	R151	RCA-183J9GW	M 18K OHM,J	1	
	R152	RCA-103J9GW	M 10K OHM,J	1	
	SW2-7	ZSW-012	SWITCH	6	

Power PCB (TH-32LRT12U-A)

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
	R101-103	211107503M	M 750K OHM,F	3	
	R110	211113002F	M 30K OHM,F	1	
	R111	211200300F	M 30 OHM,J	1	
	R115	211200300F	M 30 OHM,J	1	
	R116	211200330F	M 33 OHM,J	1	
	R112-113	211200100F	M 10 OHM,J	2	

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
	R114	211113002F	M 30K OHM,F	1	
	R121	211210100M	M 10 OHM,J	1	
	R122	211210512M	M 5.1K OHM,J	1	
	R125	211107501F	M 10K OHM,F	1	
	R126	211112701M	M 2.7K OHM,F	1	
	R127	211118201F	M 8.2K OHM,F	1	
	R128	211113901F	M 3.9K OHM,F	1	
	R129	211210101M	M 100 OHM,J	1	
	R130	211210683M	M 68K OHM,J	1	
	R131	211210683M	M 68K OHM,J	1	
	R132, 133	211108203M	M 820K OHM,F	2	
	R134	211210680M	M 68 OHM,J	1	
	R135	211210155M	M 1.5M OHM,J	1	
	R136	211119101F	M 9.1K OHM,F	1	
	R137	211210000M	M 0 OHM,J	1	
	R201-203	211200100F	M 10 OHM,J	3	
	R204	211110102M	M 1K OHM,F	1	
	R205	211112701M	M 2.7K OHM,F	1	
	R206	211110102M	M 1K OHM,F	1	
	R207	211210513M	M 51K OHM,J	1	
	R208	211210103M	M 10K OHM,F	1	
	R209	211110102M	M 1K OHM,F	1	
	R210	211114702F	M 47K OHM,F	1	
	R211	211113002F	M 30K OHM,F	1	
	R213, 214	211110102M	M IK OHM,F	2	
	R215	211210203M	M 20K OHM,J	1	
	R216	211210101M	M 100 OHM,J	1	
	R226	211210302M	M 3K OHM,J	1	
	R227	211110153M	M 15K OHM,F	1	
	R228	211210432M	M 4.3K OHM,J	1	
	R229	211110102M	M 1K OHM,F	1	
	R230	211210331M	M 330 OHM,J	1	
	R231	211210224M	M 220K OHM,J	1	
	R232	211210273M	M 27K OHM,J	1	
	R233	211200203F	M 20K OHM,J	1	
	R234-237	211210512M	M 5.1K OHM,J	4	
	R238	211118201F	M 8.2K OHM,F	1	
	R239	211102202M	M 22K OHM,F	1	
	R240	211101002M	M 10K OHM,F	1	
	R241	211210134M	M 130K OHM,F	1	
	R242-244	211101002M	M 10K OHM,F	3	
	R245	211210391M	M 390 OHM,J	1	
	R246	211200201F	M 200 OHM,J	1	
	R247	211210134M	M 130K OHM,F	1	
	R248	211200201F	M 200 OHM,J	1	
	R249	211210391M	M 390 OHM,J	1	
	R250	211110102M	M 1K OHM,F	1	
	R255	211110153M	M 1.2K OHM,F	1	
	R256	211200152F	M 1.5K OHM,J	1	
	R257	211200510F	M 51 OHM,J	1	
	R258	211110102M	M 1K OHM,F	1	
	R259	211210000M	M 0 OHM,J	1	
	R501	21A4270104F	M 100K OHM,J	1	
	R501	321207025	TUBE	1	
	R502	211200121F	M 120 OHM,J	1	
	R503	211113002F	M 30K OHM,F	1	
	R504	21L4260109F	C 1 OHM,J	1	
	R506	211210222M	M 2.2K OHM,J	1	
	R507	211210103M	M 10K OHM,F	1	
	R508	211210623M	M 62K OHM,J	1	
	R509	211200479F	M 4.7 OHM,J	1	
	R510, 511	211210000M	M 0 OHM,J	2	
	R512	211200100F	M 10 OHM,J	1	
	R513	211110102M	M 1K OHM,F	1	
	R514	211210103M	M 10K OHM,F	1	
	R515	211210222M	M 2.2K OHM,J	1	
	R524	211210622M	M 6.2K OHM,J	1	

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
	R601-603	211200332F	M 3.3K OHM,J	3	
	R605	211210363M	M 36K OHM,J	1	
	R606	211200510F	M 51 OHM,J	1	
	R607	211200100F	M 10 OHM,J	1	
	R609	21L4280088F	M 0.08 OHM,J	1	
	R609	321207025	TUBE	1	
	R610-612	211104703M	M 470K OHM,F	3	
	R613	211105103M	M 510K OHM,F	1	
	R614	211210000M	M 0 OHM,J	1	
	R616	21A4270100M	M 10 OHM,J	1	
	R617	211210511M	M 510 OHM,J	1	
	R618	211113002F	M 30K OHM,F	1	
	R619	21L4280088F	C 0.08 OHM,J	1	
	R620	211111201M	M 12K OHM,F	1	
	R621	211200100F	M 10 OHM,J	1	
	R622	211200510F	M 51 OHM,J	1	
	R623, 624	211200229F	M 2.2 OHM,J	2	
	R625	211210103M	M 10K OHM,F	1	
	R626-628	211106203M	M 620K OHM,F	3	
	J108, 109	211210000M	M 0 OHM,J	2	
	J501	211210000M	M 0 OHM,J	1	
	J608	211210000M	M 0 OHM,J	1	
	J611-613	211200000F	M 0 OHM,J	3	
	J615	211200000F	M 0 OHM,J	1	
	SG3, 4	2182K0001	SURGE ABSORBER	2	
	VA101	2180B0029	THERMISTOR	1	
	TH101	2190B0029	THERMISTOR	1	
	RS1	21D0D0009	COPPER MANGANESE WIRE	1	
	C101, 102	22BF84711	C 470PF,250V	2	
	C104	225AC93340	C 0.33UF,300V	1	
	C108	221AFE181D	E 180UF,450V	1	
	C108	221JXE18D	CONNECTOR	1	
	C109	222Q02210	C 220PF,1KV	1	
	C110	22CV02230	C 0.022UF,1000V	1	
	C111	226R51041	C0.1UF,50V	1	
	C112	226A41051	C 1UF,25V	1	
	C113	226R55611	C 560PF,50V	1	
	C115	226A41051	C 1UF,25V	1	
	C116	226R52211	C 220PF,50V	1	
	C119	226R51041	C 0.1UF,50V	1	
	C120, 121	226R52241	C 0.22UF,50V	2	
	C122	226A41051	C 1UF,25V	1	
	C123	22EAX51006	E 10UF,50V	1	
	C124	226R52241	C 0.22UF,50V	1	
	C125	22EAX51006	E 10UF,50V	1	
	C201	226151031	C 0.01UF,50V	1	
	C202, 203	22EAX2102I	E 1000UF,16V	2	
	C204	22EAX3471H	E 470UF,25V	1	
	C205	226R51041	C 0.1UF,50V	1	
	C206	22EAX2102I	E 1000UF,16V	1	
	C207	226A34741	C 0.47UF,25V	1	
	C209, 210	226R51041	C 0.1UF,50V	2	
	C211	22EAX31020	E 1000UF,25V	1	
	C216, 217	226R51041	C 0.1UF,50V	2	
	C219	226R51041	C 0.1UF,50V	1	
	C220	22EAX31020	E 1000UF,25V	1	
	C223	22EAX54700	E 47UF,50V	1	
	C225	22EAX4102A	E 1000UF,35V	1	
	C227	22EAX44710	E 470UF,35V	1	
	C229	226A34741	C 0.47UF,25V	1	
	C230	226R52241	C 0.22UF,50V	1	
	C231, 232	226A34741	C 0.47UF,25V	2	

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
	R233, 234	226R52241	C 0.22UF,50V	2	
	C235	22EAX4102A	E 1000UF,35V	1	
	C236	226R52241	E 1000UF,35V	1	
	C501	222Q02221	C 2200PF,1KV	1	
	C502	226151031	C 0.01UF,50V	1	
	C503	226A51011	C 100PF,50V	1	
	C504	226A41051	C 1UF,25V	1	
	C505	22EAX54700	E 47UF,50V	1	
	C507	22BF81021	C 1000PF,250V	1	
	C509	22EAX51006	E 10UF,50V	1	
	C512	226151031	C 0.01UF,50V	1	
	C601, 602	22CVE0011	C 1UF,450V	2	
	C603	226R52221	C 2200PF,50V	1	
	C604	226R52231	C 0.022UF,50V	1	
	C605	222Q04710	C 470PF,1KV	1	
	C606	226A41051	C 1UF,25V	1	
	C608	226R52211	C 220PF,50V	1	
	C609	22EAX51006	E 10UF,50V	1	
	C610	222Q04710	C 470PF,1KV	1	
	C612	226R52241	C 0.22UF,50V	1	
	C615	222Q04710	C 470PF,1KV	1	
	D104-107	2313AH0001	DIODE	4	
	D109	2313AH0001	DIODE	1	
	D201	2333A0056	DIODE	1	
	D201	324220308	SCREW	1	
	D202, 203	2313AH0001	DIODE	2	
	D205	2333A0056	DIODE	1	
	D206	2319A0007	DIODE	1	
	D207	2332A0013	DIODE	1	
	D208, 209	2313AH0001	DIODE	2	
	D210	2332A0013	DIODE	1	
	D210	324220308	SCREW	1	
	D213	2313AH0001	DIODE	1	
	D501	2318A0020	DIODE	1	
	D502	2319A0007	DIODE	1	
	D503	2313AH0001	DIODE	1	
	D505, 506	2313AH0001	DIODE	2	
	D602	2317A0057	DIODE	1	
	D602	2332AN0052	SCREW	1	
	D603, 604	2313AH0001	DIODE	2	
	ZD201	2352R0108	ZENER DIODE	1	
	ZD203	2352R0020	ZENER DIODE	1	
	ZD204	2352B0011	ZENER DIODE	1	
	ZD207	2352R0108	ZENER DIODE	1	
	ZD502	2352B0011	ZENER DIODE	1	
	ZD503	2352R0011	ZENER DIODE	1	
	Q101	2441AH0010	TRANSISTOR	1	
	Q102, 103	2427S0045	MOSFET	1	
	Q201	2431U0061	MOSFET	1	
	Q201	324220308	SCREW	1	
	Q202	2441AH0010	TRANSISTOR	1	
	Q204	2441AH0010	TRANSISTOR	1	
	Q501	2427K0067	MOSFET	1	
	Q503	2441AH0002	TRANSISTOR	1	
	Q504	2441AH0028	TRANSISTOR	1	
	Q507	2441AH0010	TRANSISTOR	1	
	Q508	2441AH0011	TRANSISTOR	1	
	Q601	2427N0030	MOSFET	1	
	Q602	2441AH0037	TRANSISTOR	1	
	Q603	2427N0030	MOSFET	1	
	Q604	2441AH0038	TRANSISTOR	1	
	U101	2510N0089	IC	1	
	U201	2545T0008	IC	1	
	U501	2510AE0045	IC	1	
	U601	2510AE0098	IC	1	
	PC101, 102	2522AP0005	OPTO COUPLER	1	
	PC104, 105	2522AP0005	OPTO COUPLER	1	
	IC201	2531AU0004	IC	1	
	IC203	2531AU0004	IC	1	
	F101	2793AA0015	FUSE	1	
	F101	2793E0015	TUBE	1	
	F501	2793AA0012	FUSE	1	
	F501	2793E0012	TUBE	1	
	EL01, 02	327900007	RIVET	2	
	EL03-06	327900003	RIVET	4	
	EL09-16	327900003	RIVET	8	
	EL17, 18	327900007	RIVET	2	
	EL19-52	327900002	RIVET	34	
	HS100	3271E0421	HEAT SINK	1	
	HS200	3271E0405A	HEAT SINK	1	
	HS201	3271E0420	HEAT SINK	1	
	HS202	3271E0423	HEAT SINK	1	
	HS600	3271E0422	HEAT SINK	1	
	BD101	2347A0027	BRIDGE DIODE	1	
	CN1	31505X155	CONNECTOR	1	
	CN3	31516X186	CONNECTOR	1	
	CN4	31514X150	CONNECTOR	1	
	CN7	31504X169	CONNECTOR	1	
	CN8	31503X043	CONNECTOR	1	
	PG101-103	3278D0001	GND PIN	3	
	PG201	3278D0001	GND PIN	1	
	T101	AT0576LCET39	TRANSISTOR	1	
	T501	AT0573LC2821	TRANSISTOR	1	
	L101	FC0321LC6852	CHOKE	1	
	L201	FC0335LC0520	CHOKE	1	
	L202	FC0335LC0520	CHOKE	1	
	L601	FC0344LC8052	CHOKE	1	
	L602	AT0575LC3225	TRANSISTOR	1	
	LF102	FT0332LC1810	LINE FILTER	1	
	LF103	FT0345LC1207	LINE FILTER	1	

Kit List

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
		TNM4CD0819FC	MAIN PCB	1	for 32"
		TNM4CD0819FB	MAIN PCB	1	for 37"
		TNM4CD0821F	POWER PCB	1	for 32″
		TNM4CD0822F	POWER PCB	1	for 37″
		TNM4CD0906F	IR PCB	1	for 32″
		TNM4CD0907F	IR PCB	1	for 37″
		TNM4CD0809F	KEY PCB	1	for 32"
		TNM4CD0810F	AV3 PCB	1	for 32″
		TNM4CD0820F	RS232 PCB	1	
		TNM4CD0807F	AV3+KEY PCB	1	for 37″
		TNM4CD0908F	SUB MICON UPGRADE TOOL	1	

Wire List

Safety	Ref.No.	Part No.	Part Name & Description	PCS	Remarks
		VSX37LRT1A-A	LVDS CABLE	1	for 37"
		VSX37VGL1B-A	INVERTER WIRE	1	for 37"
		VSX37VGL1D-A	14P FRONT AV WIRE	1	for 37"
		VSX37VGL1E-A	3P KEY WIRE	1	for 37"
		VSX37VGL1F-A	6P IR WIRE	1	for 37"
		VSX32LRT1G-A	5P AUDIO OUT WIRE	1	
		VSX37VGL1H-A	4P AUDIO POWER WIRE	1	for 37"
		VSX37VGL1I-A	16P POWER WIRE	1	for 37"
		VSX37VGL1J-A	SPEAKER-L WIRE	1	for 37"
		VSX37VGL1K-A	SPEAKER-R WIRE	1	for 37"
		VSX32LRT1M-A	RS232 5P LINE	1	
		VSX37LRT1N-A	HDMI CABLE	1	for U type
		VSX37LRT1O-A	GND WIRE	2	for 37"
		VSX32B101A-A	LVDS CABLE	1	for 32"
		VSX32LRT1B-A	INVERTER WIRE	1	for 32"
		VSX32VGL1D-A	14P FRONT AV WIRE	1	for 32"
		VSX32LRT1E-A	3P KEY WIRE	1	for 32"
		VSX32VGL1F-A	6P IR WIRE	1	for 32"
		VSX32LRT1G-A	5P AUDIO OUT WIRE	1	
		VSX32VGL1H-A	4P AUDIO POWER WIRE	1	for 32"
		VSX32VGL1I-A	16P POWER WIRE	1	for 32"
		VSX32VGL1J-A	SPEAKER-L WIRE	1	for 32"
		VSX32VGL1K-A	SPEAKER-R WIRE	1	for 32"
		VSX32LRT1M-A	RS232 5P WIRE	1	
		VSX32LRT1O-A	GND WIRE	1	for 32"